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ABSTRACT

This document reports the first phase of a longitudinal research project designed to produce information on how to raise children so their basic abilities may develop optimally during the first six years of life. Although this Preschool Project has been in operation five years, the study is not yet completed because statements about the effects of various child rearing practices and experiences have not been put to experimental test. Nontheless, preliminary results concerning optimal and restricted development of 48 children in a natural environment can be reported. In general, child rearing interactions during years 1-3 appear to offer the most relevance for intense investigation. The mother's direct and indirect activities appear to be the most powerful formative factors in the development of the preschool child. Some "best guesses" about the most effective child rearing practices can be made. Findings suggest that effective mothers (1) are generally permissive, (2) usually but not always respond to their child's appeals for immediate help (3) act in response to overtures by the child and (4) have a high energy level. References and tables of data are included. (WY)

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An Analysis of Excellent Early Educational Practices:

Preliminary Report *

by

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INTRODUCTION

This report is concerned with the psychological development of pre-school age children. The research described was designed to produce dependable information on the question of how to raise children so their basic abilities might develop as well as possible during their first years of life. Though our research has been underway for over five years, and though the equivalent of ten people have been working continuously on the project during this time, we are quite some distance from the completion of our studies. Nevertheless, for several reasons, we feel the time has come to report to our colleagues and to the public.

There are several important consequences of the fact that our work is not complete as we are writing this article. First of all, none of our statements about the effects of various child-rearing practices and experiences of children have been put to experimental test. This we plan to do as the next phase of our work; but, of course, without experimental confirmation we cannot have ultimate confidence in our observations on this central topic. However, our information on what one- to three-year-old children actually experience in their daily lives, our studies of natural behaviors during this age period and our work in plotting the development of various dimensions of competence during that time, all appear to be valid and of potential use. Our assessment techniques are admittedly less than perfect; however, we believe they are as good or better than any others available for the study of the one- to three-year-old child.

Although our judgments about the effects of various child-rearing practices have not been tested experimentally, they do emerge from a form of experimentation. While we have not yet seen mothers rear their children according to our recommendations, we have been conducting a "natural" experiment. We have been observing how some families manage to produce very competent three-year-olds and how other families produce much less able three-year-olds. Though our comparative analysis can only yield correlational data which must be confirmed by experimental test, we believe our observational data and test results allow us to place more stock in our hypotheses about the effects of various child-rearing practices than we might on the basis of exclusively theoretical ideas or observations of a random sample of families.

This report is being prepared in late 1970. It is important to highlight that fact because it will probably be some time before this article is in print and because the subject of this study is currently being literally assaulted by scores of research personnel. We believe that our approach to the problem of early human development is quite rare in spite of that massive research effort; for unlike most current studies, ours is not oriented toward a single developmental process such as the acquisition of language or intelligence, nor have we begun by executing intervention studies with underdeveloped children. We have instead begun by studying the development of <u>overall</u> competence in children who have gotten off to a superb start in their early years. Another way of characterizing our work is to describe its goal as optimizing human development rather than removing developmental deficits. We are in the business of prevention rather than remediation.

Our project was christened the Harvard Pre-School Project. It began in September 1965 with funds provided by the U. S. Office of Education. Ours was one of several projects in the School of Education's Research and Development Center. Accumulating evidence suggested that while most educators were concerning themselves with the educational process of children age six and older, much of a child's crucial development was over by then. By six, so it seemed, it might already be too late to prevent stunted development and to insure full growth. Thus the Pre-School Project was designed as a cornerstone for the whole research and development effort with older children. The object was to find out as much as possible about the pre-school-age child and, in particular, to study the attributes and development of the successful or educable child. The phrase we used then was that we were concerned with the development of educability.

Our mandate was maddeningly simple to express; to learn how to structure the experiences of the first six years of life so that a child might be optimally prepared for formal education. Though the problem was easily stated, the solution was not likely to be achieved with ease. Not only was the research task a formidable one, but in addition, good strategies of approach were not obvious. Our knowledge of the literature suggested that none of the then current theoretical orientations toward early human development were adequately rooted in directly relevant empirical data (with the exception of Piaget's theory of intelligence) (LaCrosse, et al., 1970). We were not committed to any particular theory. We saw this latter point as an advantage. Instead of bending children to fit a particular theoretical approach, we decided we could

immerse ourselves in preschools, observe the behavior of young children, and evolve a strategy for tracing the etiology of educability. Under the shelter of the Research and Development Center we were in a position to develop a reality-based strategy.

When we began our work, Project Head Start was only a few months old. Parent-Child centers were not yet conceived and the focus of those in early education was on the "disadvantaged" four-year-old. Our project director, Burton L. White was offered the opportunity to begin the project partly on the basis of his work with young infants (White 1971). For the preceding seven years he had worked on the problem of the role of experience in the development of adaptive abilities in the first six months of life. Those studies seemed to indicate that young infants could enjoy and apparently profit from exposure to experiences specifically designed to match their rapidly changing interests and abilities. White was quite ambivalent about beginning the project. On the one hand, a scientific approach to such a problem could obviously aspire to only limited success due to the awesome complexity of the problem and the primitivity of available research methods. On the other hand, the possibility of making a significant contribution to the development of children of future generations was too attractive to turn down. In addition, it looked at that time as if resources would be no problem. Ample funds were available, and along with the prestige of Harvard University, it looked as though the project would be able to hire a sizeable well-trained staff and that we would have quite a few years to pursue its goals. We have enjoyed the full support of the school's administration, especially from, Dean

Theodore Sizer and Dr. Gerald Lesser, Director of the Laboratory of Human Development. Two factors have hampered us somewhat: in 1968, funds for behavioral research suddenly became scarce for the first time in years. We have survived but an inordinate amount of energy has had to be devoted to fund raising. Second, the field of Early Education has been mushrooming spectacularly and thereby putting pressure of various kinds on our personnel. In spite of such difficulties, we believe we have made good progress toward our goal. Watching a human life being shaped and feeling that you are beginning to understand how a child can be helped to realize his potential is a most exciting way to earn a living. Until we test our current judgments via experimental studies, we can offer our ideas only tentatively, but we do believe we have learned a significant amount about early human development.

THE STATE OF KNOWLEDGE AT THE OUTSET OF THE PROJECT

In 1965 there were many points of view among concerned professionals about the state of knowledge of how to prepare children for formal education. A few believed that the laws of early human development were well understood and that all that was needed was an effort to apply that knowledge. Richard Wolf, a colleague of Benjamin Bloom at the University of Chicago, expressed that point of view in a seminar at the Harvard Graduate School of Education. A few others had been either writing about the problems of disadvantaged pre-school children or were actually operating experimental programs. Martin Deutsch and David Weikart were already operating compensatory pre-school elementary programs. Deutsch stressed the problem of inadequate sensory

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discrimination capacity (among other presumed deficits) while Weikart was less sure of what the root problem was and was designing eclectic programs at that time.

Carl Bereiter was performing the first dramatically successful compensatory pre-school program (Bereiter and Engelmann, 1966). His work was a form of high quality educational engineering. Bereiter concluded that the core abilities that were deficient in disadvantaged six-year-olds were cognitive and linguistic. He, therefore, devised a highly focussed remedial curriculum which aimed at rapid improvement in those areas.

In addition to those pioneers in the field, there were numerous professionals who had been working in the field of early education long before the problem of pre-school education for the disadvantaged became fashionable. Shirley Moore, at the University of Minnesota, Barbara Biber, at the Bank Street College of Education; Louise Bates Ames and Frances Ilg, at the Gesell Institute; were some of the leaders of a large group of people who could justly be called "the establishment" in the field of early education. What these people believed about the total problem of early education is hard to say. They did apparently feel that they knew enough to train teachers and direct pre-school education programs for middle-class three- to five-year-olds.

Another group of professionals operated a small number of pre-school programs for low-income children. Such programs were usually called "day care" programs rather than nursery schools. Day care programs would look after young children for as much as ten hours a day while their parents worked, whereas nursery schools usually operated

on a half-day basis. Many day care operators felt that they were pre-school educators while others only claimed to provide custodial care. This group was not often consulted on the problem of early education and their views have really never been fully heard.

Yet another type of professional came from the ranks of Developmental Psychology. J. McV. Hunt from the University of Illinois and the senior author of this study had been interested in the role of early experience in human development for many years. Hunt's interest covered the entire span of early human development whereas White had been concentrating on first six months of life. Others such as Lewis Lipsitt at Brown University, Yvonne Brackbill at the University of Colorado, had been studying conditioning processes in infancy and therefore felt a professional interest in the problem of early education. Hunt and White, at least, were quite sure that we were unprepared to cope immediately with the problem of compensatory early education. They shared the point of view that early education for <u>all</u> children, not merely those judged disadvantaged, was a societal goal of paramount importance. They also shared the view that the basic knowledge about early human development and especially about the role of experience in the development of abilities simply was not available in any but grossly inadequate amounts.

It was against this background of diversity of opinion and lack of data that the Pre-School Project began. We invested an enormous amount of energy in checking our judgment on the state of existing knowledge during the first two years of the project. Anv empirical investigation starts with an analysis of what is known about the phenomena in question.

The magnitude of this phase of a project is largely a function of two factors, the scope and complexity of the problem and the amount of previous relevant research. Because human abilities are diverse and apparently dependent on the almost infinite number of events of the individual's past, the library research of this project was a major endeavor. Library research served conventional instrumental functions, it was not an end in itself. The instrumental functions were a) to determine the baseline of knowledge from which to proceed with new work, and b) to serve an heuristic purpose as a reservoir of ideas of varying potential.

One way to organize this portion of our effort, we thought, was to simply assimilate all serious relevant research. This possibility was feasible. In the Spring of 1966, we made a preliminary survey of publications and research projects concerning children three to six years of age. We determined that we could, given a few years, digest most of the material written in English and available since 1900. We also concluded that we could assimilate all comparable new information as it appeared.

By the end of the first academic year of the Project, the core staff was familiar with the behaviors of children in the pre-school environment, an effective observational technique had been devised, much of the past work in the field had been assimilated into the Project's thought and preliminary taxonomies of tasks and coping abilities were being suggested.

It was decided that the technique of taking behavioral protocols was sufficiently powerful to provide the raw material for inducing the

components of educability. It was thus resolved that the Project would move toward systematic collection of protocol data in order to amass a strong base from which induction could proceed.

We organized and expressed our ideas on what the literature contained in position papers which summarized each of the several fields such as studies of language, intellectual development, and assessment techniques. We combined all the information into a lengthy report (LaCrosse, et al., 1970).

The pessimism with which we began the literature search was not dispelled by the two-year-effort. True, many first-rate studies of elements of the problem of early education had been done, but the question of how to structure early experience to assure the optimal development of a pre-school child remained mostly unanswered. An impressive corroboration of this judgment can be found in an editorial by Alberta Siegel which appeared in Child Development in December of 1967.

What to do? Given a strong suspicion that pre-school age children could be helped significantly by the provision of more suitable sequences of experience, but an inadequate knowledge base for designing such experiences what does one do? There seemed to be two positive directions to take: Once could plunge right into intervention work and try whatever seemed reasonable with children less than six years of age. In fact, many people did just that, often in Head Start programs, at times in field research operation such as those of Bereiter, Susan Grey, Glen Nimnicht, and David Weikart, to name a few of the better-known projects. The other obvious approach would be to work on the

problem of building the knowledge base The first approach had the virtue of offering hope for children growing up then in 1965. At the same time, it seemed clear that even if hastily conceived programs were occasionally partly successful, they were only designed to serve the emergency function of eliminating severe developmental deficits. Optimal development for each child was not their concern. The second approach could be oriented toward the problem of understanding the laws of optimal development (which might simultaneously aid in solving the compensatory education problem). The second approach would not, however, help a single child for several years. We chose the second approach.

EVOLVING A STRATEGY

We are concerned with the problem of how to structure the experiences of the first six years of life so as to encourage maximal development of human competence. Such a goal leads naturally to a consideration of two problem areas: a) what is human competence in six-year-old children, and b) how do we learn the details of the interactions between early experience and the development of such competence?

What Specifically is Human Competence at Six?

Nowhere in the literature could we find detailed descriptions of healthy well-developed six-year-old humans. We decided therefore to attempt to follow the lead of the European ethologists (Lorenz, Tinbergen, etc.). Initially, we selected as broad an array of types of pre-school children as we could. Our original sample consisted of some

400, three, four, and five-year-old children living in Eastern Massachusetts. We reached the children through 17 pre-school institutions (kindergartens and nursery schools). These children varied in at least the following dimensions: a) residence - from rural to suburban and urban, b) SES (socioeconomic status) - lower-lower to lower-upper class, c) ethnicity - Irish, Italian, Jewish, English, Portuguese, Chinese, and several other types. On the basis of extensive, independent observations by 15 staff members and the teachers of these children, and also on the basis of their performance on objective tests such as the Wechsler and tests of motor and sensory capacities, we isolated 51 children. Half were judged to be very high on overall competence, able to cope in superior fashion with anything they met, day in and day out. The other half were judged to be free from gross pathology but generally of very low competence. We then proceeded to observe these children each week for a period of eight months. We gathered some 1,100 protocols on the typical moment-to-moment activities of these children, mostly in the institutions, but also in their homes. At the end of the observation period we selected the 13 most talented and 13 least talented children. Through intensive discussions by our staff of 20 people, we compiled a list of abilities that seemed to distinguish the two groups. These abilities were divided into social and non-social types. It should be noted that not all abilities of such children were included. We concluded, for example, that differences in motor and sensory capacities between children of high and low overall competence, were generally quite modest. The resultant list of distinguishing abilities represents an

observationally-based differentiated description of what we mean by competence in pre-school children. The list is as follows:

Social Abilities

1) to get and maintain the attention of adults in socially-acceptable ways
2) to use adults as resources
3) to express both affection and hostility to adults
4) to lead and to follow peers
5) to express both affection and hostility to peers
6) to compete with peers
7) to show pride in one's accomplishments
8) to involve oneself in adult role play behavior or to otherwise express desire to grow up.

Non-Social Abilities

1) Linguistic competence; i.e., grammatical capacity, vocabulary, articulation, and extensive use of expressed language.
2) Intellectual competence
   a) the ability to sense dissonance or note discrepancies
   b) the ability to anticipate consequences
   c) the ability to deal with abstractions; i.e., numbers, letters, rules
   d) the ability to take the perspective of another
   e) the ability to make interesting associations
3) Executive abilities

a) the ability to plan and carry out multi-stepped activities

b) the ability to use resources effectively

4) Attentional ability

the ability to maintain attention to a proximal task and at the same time to monitor peripheral events (called dual focus ability)

A basis for evaluation of our hypotheses about early experience. Gathering anthropological information on pre-school age children especially during their sixth year of life was a fundamental necessity for the project. It was our way of determining both the goals and the direction of our work. The distinguishing abilities of well-developing preschoolers constitute one form of specification of desirable outcomes of early education. Another form might have been produced by asking experienced kindergarten teachers to describe excellent development at six. Yet another could have been based on performance by six-year-olds on tests of academic readiness, social maturity, and personality. Our literature search ruled out the simplest approach, which would have been to locate authoritative information on the well-developed six-year-old from the results of previous research. Hard to believe as it may be, virtually no such material was available. A conspicuous and excellent exception is the report on Colin, a "normal" pre-schooler (I.Q. in the 130's but free from clinical symptoms) by Lois Murphy and associates (1956). In that study, a multidisciplined team of professionals gathered systematic and diverse data on Colin over a three-year span beginning during his third year when he entered the Sarah Lawrence nursery school.

Only one child, however, is described.

We didn't choose to rely exclusively on the opinions of teachers (although we did extensive interviewing with them) to help acquaint ourselves with preschoolers and their environments. We were not satisfied with the degree of specificity about good development that the teachers were providing. Their descriptions were most often at a fairly global level, such as: "Johnny was so much brighter than any average child, so eager to learn," or "Mary was a sheer delight in the classroom, and very imaginative." Of course, there was more to what each teacher provided during a one-hour interview, and often the observations were very perceptive, but the need for a description of the characteristics of optimal development was too fundamental for us to rely solely on information generated this way.

The possibility of piecing together a useful picture of optimal development from data from the various types of existing tests turned out to be nil. Data from tests of social and personality development were often not useful due to very low reliability. Further, the more reliable academic readiness tests provided a very spotty, incoherent picture of a child, simply because they were designed for a rather special narrow purpose from our point of view. Since our concern was with general, or overall development, we needed more kinds of information than tests such as the Stanford-Binet could provide. Put another way, the designers of such tests were not aiming for a quantitative assessment of the full range of a child's abilities, but rather for an assessment of a child's likelihood of success in school based upon

a sampling of his linguistic and cognitive skills. Leadership and other social qualities, planning abilities, imagination, resourcefulness, and many other human abilities were outside the scope of such tests.

A source of direction for etiological, early education research

Once we had our working definition of the competent six-year-old child, we knew we had a basis for evaluating our eventual hypotheses about the role of experience in early development. Without a clear position on this issue of specific goals, no program of educational research can have coherence or good prospects for success. In addition to this basic role, our definition of competence could also serve a vital guiding function for our etiological research. If you start with an item from the Stanford-Binet such as success in solving maze problems, you could of course, then plot the growth of this capacity by testing children at younger ages. However, the child of less than two-and-a-half years of age is not really testable on such an item; and, furthermore, you would be hard-pressed to identify factors in the child's early experiences which might influence the development of that skill. Our observationally-generated dimensions of competence seem to be more suitable for an etiological, early education study. For example, using an adult as a resource is an ability that most all children engage in repeatedly, in one way or another from birth, and therefore the growth of each child's ability in that area can be monitored and assessed throughout the early years. Furthermore, and of even greater importance, such an ability suggests where to look for aalient experiences and influences on development. In this case, one is obliged to study the early social

experiences of the child, and as you might guess, the role of the mother as she behaves in this particular regard (as a potential resource), appears to be of central importance. Getting and maintaining the attention of an adult is another competence dimension with such advantages, as are most of our target abilities.

A Potential Description of the Goals of any Early Education Program. Aside from the general lack of dependable knowledge about rearing children, the most serious problem early educators face is a lack of clarity about their goals. We would like to suggest that the aforementioned description of distinguishing attributes of highly competent three to six-year-old children may be one acceptable though tentative definition of the goals of early child-rearing or early formal education. Surely that list is not necessarily the best possible, but it does go beyond a deficiency-oriented concentration on pre-academic skills; and, in addition, it is more specific than most "whole-child" program aspirations.

The Etiology of Competence in Young Children

The next step in our strategy (like most of the process) was obvious. Once we had decided to gamble on the validity of our description of the distinguishing qualities of the very competent six-year-old, we began to study the growth of these abilities. This process overlapped and extended beyond the process of isolating and refining the dimensions of competence. It should be noted that we were not yet investing in the problem of measurement although we were committed to a scientific form of investigation. The question of what was worth measuring and when we should go beyond subjective rating techniques in assessing competence was a chronic concern. We decided to develop instruments to assess competence levels

and maternal behaviors but to do so with caution. We were not sure what age range (of pre-school child) we would be concentrating on, and we knew that designing new assessment techniques would be a very large task.*

Again, using the method of group discussions of each child based on extensive observational records and objective test scores, we examined the issue of the growth of competence as we had defined it. We considered all the three to six-year-old children we had come to know well over a two-year period. This number was now well over a hundred, about 75% of whom were developing either very well or rather poorly, with perhaps 20 to 25% (the remainder) developing in average fashion. Our staff (numbering some twenty people by now) came to a rather remarkable conclusion. Our well-developed three-year-olds (called 3As) looked more like four to five and six-year old As on our target abilities than did our older poorly developing (C) children. If we had to guess which group would have done better in first grade had 3As and older Cs entered the following year, we would have chosen the 3As over the 5 and 6Cs. Though this judgment was clearly made on less than ideal grounds, as a group we were most impressed by its probable truth. Now this judgment does not mean that 6A children don't have better language and intellectual skills than 3As. Nor does it mean that 6Cs have no abilities of any consequence. In the absence of quantitative data on the several dimensions of competence we were unable to say more than that the general

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* We did develop tools for assessing dual-focussing ability and social competence for the three to six-age-range.

thesis seemed valid to us. In the area of social competence, for example, we found 3As routinely using adults as a resource as did 6As, in contrast to Cs of all ages, who acted this way far less often. Dual focussing was a regular characteristic of As regardless of age, and rarely seen in C children. In other ability areas, differences though impressive were less striking; for example, the language of 3As was not necessarily superior to that of the 6Cs and clearly considerably less developed than that of the 6As.

The implications of this judgment of the remarkable level of achievement of some three-year-olds, were most important for the project and potentially for the field of early education. If most of the qualities that distinguish outstanding six-year-olds can be achieved in large measure by age three, the focus of the project could be narrowed dramatically. We rather abruptly found ourselves concentraing on the zero to three-age-range.

Narrowing the study immediately finessed a large amount of work. We reasoned that our first priority was to examine the early growth of human competence in its optimal form. Our judgment about 3As meant that much of what we wanted to learn probably could be found if we examined the processes of development during the first three years of life. If so, then we could concentrate our instrument construction work and data gathering and analysis effort on that period, and set aside work with three-to-six-year-old children for the time being. It also meant that

some of the work we had invested in the three-to six-age-range was wasted. We counted such waste as part of the price you pay when you attempt to break new ground in a problem area.*

NARROWING THE FOCUS

The literature on human development during the first three years of life was the source of another judgment which has shaped our efforts. Though all signs indicated that developmental divergence was a major national problem with six-year-olds, (and so, Project Head Start) it does not begin until sometime during the second year of life. The number of American children undergoing severe physical or psychological abuse from, for example, being kept in the attic for several years, or being beaten or starved regularly is mercifully a fraction of one percent of all young children. Such children do very poorly on developmental tests at one year of life. Aside from such extreme pathological cases, studies of infants from various socioeconomic backgrounds seem to indicate that those many four, five, and six-year-old children we are worrying about now didn't look any different from the best of their peers until some time during their second year of life (Florence Halpern (1969) and E. S. Schaefer

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* Interestingly, compensatory early education efforts were moving down the age ladder in parallel as their focus shifted (in part) a year or so later from the four-year-old to the three-year old and then in 1968 to the zero-to three-age-range.

(1968) among many). Now some will vigorously argue this point. T. D. Wachs, et al. (1967) seem to have found very modest but possible significant deficits in "disadvantaged" eleven-month-old children in Piagetian sensorimotor intelligence development. On the other hand M. Golden and Beverly Birns (1969) found none all the way up to twenty-four months of age.

It appeared then that under the variety of early rearing conditions prevalent in moderan American homes, divergence with respect to the development of educability and overall competence first becomes manifest sometime during the second year of life, and becomes quite substantial, in many cases, by three years of age. We therefore resolved to focus our effort on the process of the development of competence during the second and third years of life. Nothing that we have learned since has changed our confidence in that judgment. In fact, what we have learned has suggested a reasonable explanation.

Two major factors that underly the effectiveness of early child rearing practices have suggested themselves in our recent work; the development of locomotor ability, (walking) and the emergence of language. For the better part of the first year, the infant's ability to move about is very limited. For the first eight months he usually cannot even crawl. Even when he begins to crawl and then walk about while holding on to a support (cruise) he is considerably less mobile than the fourteen-to eighteen-month-old who can usually walk, and climb both furniture and stairs. This increased mobility combined with the curiosity typical of a child this age produces a very real stress on the caretaker (usually

the mother). After all, though he can move about, he is still clumsy and unsure of his large muscle skills; and though he is curious, he is inexperienced, so that razor blades and electric outlets are perceived simply as additional objects to explore. His clumsiness and lack of practiced judgment mean that he is prone to personal injury and also likely to damage breakable household items. None of these factors confront the infant's mother until the end of his first year of life and they become most pressing during the second and third years. Families adopt a variety of methods of dealing with the toddler. Some "childproof" the home, others follow the child everywhere, others restrict the child's range of mobility, and some use various combinations of these techniques. It appears from our work that part of the answer to why some children develop better than others during this age period lies in the manner of response of the mother to the emergence of locomotor mobility in her child.

The second major factor is language. In a manner virtually parallel to locomotor ability, language ability is essentially nil during the first eight or nine months of life, then moves ahead dramatically (especially receptive language) during the second and third years of life. What families provide in the way of elaborate or simple, clever or dull, voluminous or sparse language during the first eight months of life, is far less likely to influence development that what they do in regard to language in the second and third years of a child's life.

Add to these two factors the impression that few mothers (as yet) have clear ideas about the particular psychological needs of very young

infants in cribs and the result is at least a reasonable explanation of why developmental divergence often doesn't become clear until the second year of life.

THE PLAN OF ATTACK

Once the prime focus of the project had been achieved, the shape of our succeeding efforts seemed clear. We prepared the following plan:

1) Develop measuring instruments for the one to three-year-old child for:

   (a) the dimensions of competence

   (b) the stream of experience

   (c) salient environmental factors such as maternal behavior and physical circumstances

   (d) screening out handicapped children

2) Study the process of optimal development of competence where it is currently occurring naturally.

3) Simultaneously study the process of restricted development of competence where it is currently occurring naturally.

4) Find the major apparent differences in the patterns of experience across the two sets of children.

5) Find the major apparent environmental causes for the differences in experience most likely to influence the development of competence.

6) Isolate those environmental causes that might be amenable to change.

7) Test our ideas experimentally about the influence of experiences on the development of competence by providing optimal patterns of experience for one to three-year-old children who would ordinarily develop average levels of competence.

8) Refine our ideas in the light of the results of our experiments, adjust our hypotheses and retest. Repeat the cycle until we feel we have done as much as we can to solve the problem.

Quantitative Methods for the Study of the Role of Experience in the Development of Competence

The primary purpose of our planned longitudinal natural experiment was to search for environmental factors which play important causal roles in the early development of human competence. It should be noted that the major causes of developing competence need not involve the environment in any significant way. Indeed, several leading students of the problem (including Jensen, 1969) seem to hold the view that our search would be fruitless. Our view was, and is, that there was good reason to believe that environmental factors do play an important role in early human development and further, that the possibility was far too vital an issue to leave untouched by direct inquiry.

The usefulness of our data on the environments of the young children in our first longitudinal study depended on the levels of competence our subjects achieved. Dependable yardsticks for assessing competence levels were therefore necessary. We faced several difficult problems in respect to the assessment of competence. First of all, we had described some twenty-one dimensions of competence. Second, children between one and

three years of age are extremely difficult to test particularly when language is an element in the procedure. In addition, our early efforts at test development confirmed the wide-spread belief that children were inclined to be negativistic during their second year of life. When you consider that a test situation often involves a direction to a subject to point to a picture or operate a mechanism, etc., you can see that that negativism is incompatible with valid test results. Preliminary data indicates that the likelihood that a child will comply with a request by his mother is quite variable during this age range, reaching a probability of less than 50% during the eighteen-to twenty-four-month age range. When someone other than the child's mother administers tests during that period, the likelihood of compliance is often even lower. We have therefore avoided such testing during the fifteen-to twenty-one-month age range.

Another serious problem for us was that our strength did not lie in the area of the development of assessment techniques. Such skills constitute a difficult specialty in which our staff has only modest competence. We tried to find existing assessment techniques but found very few for this age range. In receptive language development, for example, virtually all previous investigators had simply asked mothers what language their children understood. We were not content with this method. For social skills, there were not existing methods for assessing the processes we were interested in. We attempted to subcontract with the nation's leading test specialists. We visited with them and described what we wanted to measure. After several months, we learned

that they were quite unable to help us. We, therefore, began the process on our own.

We invested two years in developing assessment techniques of various kinds. For the development of competence, we selected the following processes from our large list: all the social skills, two facets of receptive language development, the capacity to sense dissonance or note discrepancies, and the capacity for abstract thinking. For the analysis of ongoing experience we developed what we call our task instrument. For studying salient environmental factors, we developed an interview procedure for use with mothers, a scale for use when observing maternal child-rearing behavior, and an observational tool for guaging the child's utilization of his physical surroundings. We also developed screening instruments to help us exclude children with visual or auditory defects from the study.

For this report, I will only deal directly with the task instrument, and data collected using that instrument. I shall, of course, rely on other data from our study and discuss the issues of child-rearing practices and their effects.

An Instrument For the Quantitative Analysis of the Stream of Experience of One- to Six-Year-Old Children*

Nowhere in the literature could we find information about the ongoing experiences of infants and toddlers nor could we find many analytic

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* The development of this instrument was the work of Kitty Riley Clark Andrew Cohn, Cherry Wedgewood Collins, Barbara Kaban, and Burton L. White.

techniques for gathering such data. The approach that seemed most promising to us was the work of Roger Barker and Herbert Wright and their associates at Kansas. In their attempts at building a quantitative inquiry into human ecology, we believed there was the potential for gathering adequately-detailed information on the moment-to-moment experiences of young children.

The approach we have taken is not a conservative one in many respects. We observe children as they go about their normal activities. We tape-record a continuous series of remarks designed to include our best common sense judgments as to what the child is trying to do from moment-to-moment, along with other relevant information about stimulating factors, impediments, and his success or failure. After ten minutes of such recording with the duration of tasks timed to the second with stop watches, we play back the tape and code the record during the next twenty minutes. Three such cycles are a normal half-day's work.

We constructed a coding scheme <u>inductively</u> from such running records. The preliminary scheme was field-tested and revised more times than I'd care to mention over a period of about twelve months; at first with three-to six-year-olds, then with one- to three-year-olds. The result is an instrument with thirty-five individual and several combination classes plus a wastebasket category for those times when no purpose is even remotely discernible in the behavior of the subject. The categories are defined as follows:

Social Tasks: Labels and Definitions

1) To Please/Cooperate*

Def: To attempt to satisfy or give pleasure to another, or simply to comply with another's directive when there is no evidence the compliance is unwilling.

2) To Gain Approval

Def: To ask (verbally or non-verbally) for favorable comment on a piece of work or on behavior.

3) To Procure A Service

Def: To try to obtain aid from another.

4) To Achieve Social Contact - To Gain Attention

Def: a) to join a group

b) to initiate social contact

c) to maximize the chance of being noticed

5) To Maintain Social Contact

Def: To be absorbed in ensuring that a social contact continues, or to be interested in the social pleasantry rather than in the content of a conversation or other activity.

6) To Avoid Unpleasant Circumstances

Def: To do something for the purpose of evading actual disapproval, possible disapproval or simply a clash.

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* We now separate to please from to cooperate as a function of whether the child (in to please) or the mother (in to cooperate) initiates the task.

7) To Reject Overtures, Peer Contact, To Avoid Attention

Def: To refuse to allow to join one's group or become sociable with one's self. Rarely: to act in order to minimize the possibility of being noticed.

8) To Annoy

Def: To disturb or irritate. To act in a manner designed to displease.

9) To Dominate, To Direct or Lead

Def: To play the leader role or to demonstrate a process to others or advise others, in short, to direct a specific activity of others.

10) To Compete, Gain Status

Def: To contend for something (e.g., in games involving competition), to make comparisons between own "superior" product (possession, etc.) and other product (possession, etc.) or to try to elevate one's standing (in one's own eyes or in the eyes of an audience) by appealing to an authority figure.

11) To Resist Domination, Assert Self

Def: To oppose any intrusion on one's personal domain including both:

a) resistance to demands, orders or any trampling underfoot and

b) protection of property

12) To Enjoy Pets

Def: Affectionate play with animals.

13) To Provide Information

Def: To indicate or communicate, in a public way, one's affects, desires, needs, or specific intelligence.

14) To Converse

Def: Any give and take of verbalization, when there is mutual interest in the conversation rather than a social, or some other overtone, or where the communications cannot be heard.

15) Production of Verbalizations

Def: The actual production of communication. That is when a child is engaged in the give and take of exchanging communications and he is deficient in the language skills and cannot get across what he wants to say.

Non-Social Tasks: Labels and Definitions

1) To Eat

Def: To ingest food or drink.

2) To Relieve Oneself

Def: To void or to eliminate.

3) To Dress/Undress Oneself

Def: Self-explanatory.

4) To Ease Discomfort

Def: Purposeful behavior to alleviate physical or psychic discomfort, in contrast to apparently aimless or habitual behavior.

5) To Restore Order

Def: To return things to a previously acceptable state but not for the purpose of easing discomfort.

6) To Choose

Def: To choose a specific object from an array.

7) To Procure An Object

Def: To get something not as an instrumental task for constructing a product but as a task per se. If procuring an object in order to use it for constructing a product or for any purpose takes longer than 15 seconds it is coded as focal.

8) To Construct a Product

Def: Involves the whole complex of behavior of procuring materials and using the materials (e.g., glue, pencils, piece of puzzle) oriented toward the end product as a consequence of the use of the materials.

9) To Engage in Large Muscle Activity

Def: To engage in large muscle activity as an end in itself, not as a means of getting attention, being a member of a group, etc. To use gross motor muscles to propel all or some part of his body or to perform other motor activities which require unusual physical effort and coordination. Working hard to do something with the body that is out of the ordinary; e.g., bike riding up a hill (after the skill has been mastered.)

10) Non-Task Behavior

Def: To remain in place and not dwell on any specific object (e.g., desultory scanning, sitting with eyes closed or holding a blank stare) or to engage in gross motor locomotion in a non-systematic fashion as an end in itself, nor to pass time.

11) To Pass Time

Def: To occupy oneself with some alternative task in a situation

where one is captive (i.e., must remain in the field) and where the prescribed activity holds no appeal for one. To occupy oneself while waiting for a prescribed activity to begin.

12) To Find Something To Do

Def: S moves around, sampling objects and activities in a purposeful fashion but does not settle in on anything specific.

13) To Prepare For An Activity

Def: To perform the socially prescribed activities or sequence of actions that a child carries out almost automatically due to previous experience and/or practice in order to prepare for something that the child anticipates.

14) To Explore

Def: To explore materials, objects, activities, people. To investigate the properties or nature of materials, objects, activities or people through touch, tests, vision, etc. Experimenting with an object or material's possibilities by adding to it or taking something away from it as the primary concern rather than for the purpose of constructing a product or because of interest in the process per se, as is evident in to pretend to be someone or something else.

15) To Pretend to be Someone or Something Else

Def: To pretend to be someone or something else, for example, to dress up like one's mother. To engage in a typical adult activity for the sake of the activity per se, not with the purpose of constructing a product or exploring materials.

16) To Improve a Developing Motor, Intellectual or Verbal Skill

Def: To improve a developing motor, intellectual or verbal skill is typically distinguished by the redundancy of S's behavior (i.e., repeats the same sequence of actions again and again) and by less than masterful skill in performing the activity in question.

17) To Gain Information

Def: To gain information or instructions through listening and/or watching where the prime interest is on the content of the information being made available, i.e., S is hooked on the content of the instructions, and is not oriented toward pleasing T, etc.

18) To Gain Pleasure

Def: To engage in a task for no other reason but to enjoy oneself.

19) To Imitate

Def: The immediate reproduction of the behavior of another person.

20) To Operate a Mechanism

Def: When S attempts to use or manipulate a mechanism. Operating a mechanism is, by definition, instrumental but becomes focal because it takes 15 seconds or longer to execute.

Let me emphasize one point. Neither the task labels nor the extended definitions in our manual constitute airtight behavioral descriptions. We have attempted to keep our inferences as closely tied to behavior as humanly possible. It is true that one could be considerably less inferential than we have been in recording ongoing behavior. There were two major reasons for proceeding as we did. First, we felt that more literal descriptions of behavior would have resulted in a totally

unmanageable number of classes; and, second, we thought that this system of labeling the units of experience would prove useful in unraveling the interrelations among environmental factors and developing abilities. At any rate, we do not pretend that this is the only, or necessarily the wisest, way to attack the problem, but one has to start somewhere.

Informal tests of inter-observer reliability were an integral part of the evolution of the instrument. The uniqueness, complexity and precision of timing involved in this venture argued for modest aspirations regarding reliability. We set 2/3 or 66.7% agreement as our goal. If, for example, a two-year-old engaged in 30 tasks in 10 minutes, both observers had to have labeled at least 6.67 minutes of behavior identically to within 5 seconds before we considered the instrument to have minimally acceptable reliability.

Our several tests of reliability produced percentage agreements which range from 67 to 71%. Though we would prefer scores above 85%, we will have to live with lower reliability for the time being.

STUDYING THE PROCESS OF OPTIMAL AND RESTRICTED DEVELOPMENT OF COMPETENCE WHEN IT IS OCCURRING NATURALLY

The Longitudinal Natural Experiment

Subjects. Originally we planned to study 48 children as they developed during the second and third years of life. Twenty-four children would have been one year old when we began. Half would have come from families which had previously reared children who had attained

very high levels of competence; the other half from families whose previous children had developed lower than average levels of competence. We planned to follow that group for two years. The remaining 24 children would similarly have been divided among A and C families but would have been started at two years of age and followed for one year in order that we might learn something about third year phenomena sooner than if we had to wait for our one-year-olds to turn two.

We knew, of course, that we would probably lose some of our subjects due to illness, family disruptions, and relocations, etc. We also expected that some of our predictions about how well children would develop would turn out to be false. And, of course, unless a child did develop as either an A or a C, data on his history of experiences would weaken the usefulness of our pool of information on excellent and poor child-rearing practices. We, therefore, planned to start with 60 families. That plan turned out to be totally unrealistic.

First of all, since we wanted to start all the children in the study within the space of a few months time and at about their first or second birthday, we could not use children whose birthdays fell at other times of the year. Second, we were planning to deal with special kinds of children who constituted a small minority of all children. Third, we were fairly sure we would have trouble working with families who were doing a poor job of rearing their children. And finally, since we fully intended to gather extensive data on the average of once a week for at least 26 weeks of each year, we simply would have drowned

in the sheer volume of work and information. We have therefore resigned ourselves to an upper limit of 35 to 40 children with slightly more As than Cs.

Sample Procurement. Mechanism A The prime means by which we hoped to identify subjects at one or two years of age most likely to be reared either extremely well or rather badly was through the elementary school performance of their older siblings. Toward this end we held meetings with top personnel of three surrounding community school systems. We were successful in each case in procuring their complete cooperation. We then met with the principals of 14 schools in several areas. We procured their cooperation as well. We then solicited the names of likely families from teachers and counselors within these schools from a gross population of approximately 4,500 children. Letters were sent to the families suggested. Those who granted permission for us to examine, in detail, the school performance of their older children and were interested in the project were followed up. If they had children very close to one or two years of age, the school records and teacher's ratings of each child were scrutinized and those that met our criteria tentatively entered our subject group. From this rather expensive source we so far have approximately five subjects with the likelihood of an additional five at the most.

Mechanism B - The almost heroic effort required to generate subjects through Mechanism A forced us to consider alternatives. One problem with Mechanism A is that a family with a nine- or ten-year-old is not as likely to have a one- or two-year-old, as the family with three- to eight-year-

old children. Since nursery school personnel are sometimes extremely astute observers of young children, we have utilized their judgments as primary guides to additional subjects. We procured the cooperation of three experienced and extraordinarily capable heads of nursery schools. Through them we have procured an additional six subjects.

Mechanism C - During the last four years we have worked with several hundred families. Some of them have been the source of a few additional subjects.

Mechanism D - The massive National Collaborative Study has a Boston branch located at the Boston Lying-In Hospital. Their records include data on some 11,000 families. We procured access to those records and screened all families likely to have children we might use. We found an additional fifteen subjects through this mechanism. However, all we learned from their records, germane to the issue of general level of competence of a child, is from a single I.Q. score. Since we needed to know much more on older siblings, we were obliged to expend additional energies with respect to families from this source. In those cases where the older child was attending school in a community with which we were working, we were able with some additional effort, to procure access to teacher's ratings and test data.

In spite of our best efforts we had only managed to admit some 40 families of the desired 48 into the study by the Fall of 1970. Several of those families were subsequently dropped for various reasons. We were having our greatest difficulty with C families, those who seem to be doing a rather poor job of rearing their children, and with low-

income families. These problems were anticipated, but not sufficiently.

As of December 1970, we have a sample of 33 families in the study. Of these,13 have one-year-old children, 20 have two-year-old children, 21 have A children, 12 are C, 16 are lowere SES (socioeconomic status), 17 are middle SES.

Design considerations. Our first longitudinal study is a natural experiment. We want to learn the details of excellent child-rearing practices for the second and third years of life. We are therefore observing two sets of families as they rear their children during those years. One set of families has been selected because we have reason to believe that their children will attain high levels of competence as defined by our project. The other set has been selected because we believe their children will achieve a less than average level of general competence. Of course, our predictions for any number of reasons may turn out to be wrong at times (as indeed they have) and we have acknowledged this likelihood in our plans.

After screening each subject for assurance of physical normality, we conduct an interview with his mother to gain a general understanding of household routines, schedules and other information relevant to the child's everday experience. Within a few days of his birthday (usually about a week after the interview) we begin formal data collecting.

We need to monitor the development of competence to validate the utility of data on the experiences of the child and data on environmental influences on those experiences. Further, if we have guessed wrong about an infant's likelihood for outstanding growth (either positive or

negative) we need to know as soon as possible, so as to avoid a continuing investment in a family that would be less useful to us than another. Fourteen tests for the development of various aspects of competence are administered during the second year of life. Fifteen or eighteen such tests are administered during the third year of life depending on whether a child started in the project at one or two years of age.

We gather data on the typical experiences of our subjects once each three weeks, six months out of each year. Since we collect three ten-minute continuous records each visit, we accumulate thirty such protocols each year for each child. Correspondingly, we gather data on the child's social experience, his mother's interactions with him and his utilization of the physical environment (toys, furniture, areas of rooms, etc.) once every three weeks for six months of the year. The result is a very substantial amount of systematically interrelated data on each child. The schedule of observation and test sessions is illustrated in Figs. 1 and 2.

Special note should be taken at this point of the danger of drowning in information. Each ten-minute task record may involve as many as forty or more separately coded and analyzed events. We collect thirty a year for each child. The numbers involved are very large. On the one hand, such an amount of data help insure the validity of our findings. On the other hand, many a longitudinal study has collected (at great expense) masses of data, much of which was subsequently not used.

Preliminary Results

For this preliminary report, I should like to present and discuss a modest amount of data on the history of experiences of A and C

children during the 12 to 15 and 24 to 27-month-age range and use it as the basis for a discussion of the role of experience in the development of competence.

Task data - general. Figures 3 through 6 represent stream of experience or task data on one- and two-year-old A and C children. Tables 1 through 4 contain the data from which the Figures were constructed. There are quite a number of interesting points to be noted within this information.

First of all note the predominance of non-social tasks. Regardless of whether a child is developing very well or very poorly, he spends far more time oriented toward interactions with physical reality than he does trying to effect people. For one-year-olds the figures are 88.1% for non-social tasks versus 11.9% for social tasks. For twos, the figures are 80.8% for non-social tasks versus 19.2% for social. There is a near doubling of social tasks between the first and second birthdays. (Later I will dwell on the rather striking fact that superb mothers apparently spend very little time in direct interaction with their children during this period.)

A second unexpected finding is that the predominant experience of most children in this age range is what we call "gain information - visual" which is, staring steadily at one object or scene for at least three seconds. Only one of many child psychologists I have asked guessed correctly that visual inquiry was the most frequent activity of this age range. Little wonder, however, when you realize how few professionals have studied the one-to three-year-old child, especially under natural circumstances.

Other general points are: Exploring objects is a common activity with one-year-olds and seems to be followed, as the child matures, by mastery behavior (i.e., practicing simple skills such as putting small objects in and out of receptacles, putting lids on and off containers, etc.).

Non-task behavior (desultory scanning or wandering) is quite common among one- and two-year-old children.

Cooperation tasks increase during the third year of life reflecting increased demands made by others (usually the mother) on the growing child.

Achieving and maintaining social contact are the most common social tasks of one-year-olds and they increase during the second year.

Procuring the services of another (usually the mother) is an emergent during the second year as is to annoy (another person).

Asserting oneself or resisting domination is most frequent in homes where other young children are nearby a good deal of the time. (Older siblings spend very little time with one-and two-year-olds.)

Gaining information through looking and hearing relevant language (gain information - audio + visual) increases during the second year of life.

Task Data - A Versus C Children

The strategy of our project is to look for differences of potential importance in the everyday experiences of young children. We cannot be sure of our current judgments on that issue since we are only discussing some 10% of the data we will ultimately have from our natural experiment. Nonetheless, we can make some educated guesses. I repeat, the following

are educated guesses.

At 12 to 15 months of age the social tasks of A and C children look very similar. There may be more overtures toward the mother by C children (to please) and more instances of assert self (usually with peers) but the differences are only barely suggestive from these data.

The picture with regard to non-social tasks is, however, more promising. The striking difference in pass time experience suggests that C mothers may be far more restrictive than A mothers at this point in their children's lives. Remember, our n, for these data, is only 3 C children and 10 A children, but nevertheless, this difference is probably real. Furthermore, there seem to exist reasonable and obvious bases for such differences which I shall discuss later. Suffice to say, that our C mothers seem to use playpens and gates to restrict the gross movements of their children much more than A mothers.

A children apparently engage in more mastery behavior at this stage than do C children and they may be exposed to more relevant language when looking at things or people than C children.

At 24 to 27 months of age there are few more possibly significant differences. A mothers seem to make more demands on their children (to cooperate). C children make many more overtures to their mothers (to please and to achieve social contact). A children try to speak to their mothers to provide information more than C children. Finally, C children seem to make more attempts to annoy others (both siblings and mothers).

Some Individual Task Profiles

Our analyses seemed to proceed most fruitfully when we begin with the examination of individual cases against the context of group

characteristics. Each child is, of course, unique, and we try to understand that uniqueness as well as we can; but experience has shown us that consideration of the common characteristics of children is essential if one is interested in principles of development. Let us then consider a few individual cases in the light of the previous remarks about group qualities and in order to contrast individuals with each other.

Child 1 A - Figures 7 and 8 show task data on Child 1 A who seems to be developing very well. This child is a boy. There are three older siblings and both parents are medical doctors. His mother is not currently pursuing her professional career. Our first test data gathered when the child was about 12-1/2 months of age suggested that there was nothing remarkably precocious about the child. If anything, he appeared to be rather immature physically. By eighteen months of age, this child's test data clearly indicated precocity. In particular, his receptive language development has been very rapid.

His social experiences, though his mother was almost always nearby, occupied very little of his time and were typical of all of our one-year-olds. His non-social experiences are notable in that he engaged in much more mastery experience that most of our one-year-olds and correspondingly he spent more time procuring objects and preparing for activities than most children of his age. Other points of significance are that he had low amounts of gain information - audio + visual reflecting the fact that his mother spent comparatively little time talking to him during these months, and finally, he had virtually no pass time experience reflecting the general permissive attitude his mother displayed toward his exploratory

efforts. This home was especially remarkable in that the child had free run of the entire first floor of a large home which was positively saturated with objects to interest a one-year-old. He was regularly encouraged to explore his own toys and those of his siblings, his parent's books, ash trays, etc., and the contents of the kitchen cabinets. His mother was constantly doing household chores but usually not too busy to respond briefly to his friendly overtures or many needs for assistance as he encountered obstacles. There were no gates on stairs or in doorways, and the playpen was only used for bottle feeding episodes.

Child 1C1 - Figures 9 and 10 show task data for Child 1C1 who seems to be developing rather poorly. This child is a girl. There are eleven older siblings. Her mother does not work and has only a high school education. She is a lovely woman and her pleasure in life seems to be reflected by the entire family. The father is a custodian with a similarly modest educational background. Our initial test data on this child suggested that she was somewhat precocious. Subsequent testing has indicated a steady decline in her general development though she has developed certain social skills effectively.

Her social experiences seem typical of one-year-olds with perhaps slightly more cooperate and assert self tasks. Her non-social tasks are quite different from that of child 1 A. Most notable is her non-task score which is far higher than most one-year-olds. This child's movements are unrestricted like those of child 1 A and she, too, has the run of the entire first floor with a fairly large area, but her home

has very few objects that might interest her. The home is sparsely furnished and she has almost no toys of her own, nor are many of those of her siblings in evidence. She is not encouraged to explore the contents of the kitchen or the bathroom. She, like most one-year-olds, is not very interested in television, even though the set is occasionally on. She spends an enormous amount of time wandering or eating snacks or drinking water or juice or milk. Her mother obviously loves her and shows her love very frequently, often by feeding her.

She receives very little relevant language from her mother or her siblings. She engages in very little mastery behavior.

Child 1 C 2 - Figures 11 and 12 show task data for this child, who is a girl. She has four older siblings, who range in age from six to twelve years. Her mother is a woman of modest education and great warmth who came to this country from Central America about five years ago. English of a good quality is generally spoken in the home. The father has a similarly modest educational background and has a non-professional job. He is occasionally home during the day and appears to be an unusually soft-spoken and gentle man. As usual, the mother is continuously engaged in household chores. The family occupies one-half of a fourteen-room house and though the building is in rather poor condition, the family's quarters are well-kept and tastefully furnished.

This child is probably our most striking example of the phenomenon of excessive mother orientation in our study. A great deal of her waking life is devoted to clinging to and attempting to monopolize her mother's attention. Her motherfrequently remarks that the child sticks to her like glue,and

never gives her a moment to herself. On the other hand, we have never seen the mother reveal any overt signs of hostility directed toward the child. Her maintain social contact entry is the highest for all one-year olds and she engages in more to please overtures to the mother and more self-assertion with her mother than any other child.

The non-social task data suggest a good deal of "empty time" (non-task behavior) and a very large amount of gain information (audio + visual). The latter score is somewhat misleading in that the majority of the language is provided by the television set rather than her mother. She does not prepare for activities nor spend time procuring objects. Nevertheless, she engages in an average amount of mastery and exploratory activities. Her pass time score (zero)indicates that she is rarely restricted by her mother.

Child 2 A - Figures 13 and 14 show task data for child 2 A who is clearly developing exceptionally well.* This child is a boy. There is one older sibling, a five-year-old girl. The child's mother does not work but she has a college education. The family lives in a small modern apartment and the mother, who has no help, seems like most mothers in the

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* The judgment of how well a child is doing becomes increasingly sure after the child reaches 24 months of age. Test reliability and validity increases along with developmental divergence.

study to be working steadily throughout the day. The father is a medical student.

The social task profile suggests that the child spends a lot of time maintaining contact with her mother and that she is a bit more permissive than most of the mothers of two-year-olds in that she makes fewer requests of the child than the other mothers (see the low to cooperate entry). There is also an indication of more conversation experiences than the average. These conversations are usually with his mother, though this child plays more with his sister than most of the other children we see in similar circumstances. He seems to be more sociable than other boys his age.

The non-social task data are typical for his group except that this child has considerably less mastery experience than the group. This child has no lack of suitable opportunities for this kind of experience. The home has many toys and other small manipulable objects and his mother does not restrict his explorations. Nevertheless, rather than avail himself of these opportunities, he seems to prefer activities which focus on people; especially looking and talking. He has few periods when he is not actively engaged (see the low non-task entry).

Child 2 C - Figures 15 and 16 show task data for child 2 C who is developing poorly though not in all dimensions of competence. This child is a boy with one sibling, a five-year-old girl. His mother has a high school education and does not work. His father is a bus driver. They live in an attractive six-room, first floor apartment which has a back porch and a small yard. As usual, the mother has a good deal of housework; and in addition, she is pregnant.

The boy has much more social experience than most of our two-year-olds and virtually all of it is oriented toward his mother. She often sends him out the back door so she may get some peace, and he just as often tries to get back to her. There is a high entry in maintaining social contact. There are very high entries in procure a service, achieve social contact and to annoy.

The non-social task data reflect this child's unusual degree of orientation toward his mother and his lack of access to suitable experiences involving exploration of physical reality. There are very few small objects, toys or non-toys, available to this child although the home is well furnished and includes a new, large color television set. His mother does not allow the child to create clutter in the home. He is forbidden access to kitchen and bathroom materials; and should he mess up his room, he is promptly and severely scolded. The back porch and yard contain an expensive scooter for him and a large swing set. He watches television occasionally but rarely is it a children's program. He has a high mastery score which consists almost exclusively of large muscle activities such as pushing his scooter or climbing and swinging on the outdoor equipment. He does far less steady looking at objects or events than most children. Finally, his ease discomfort score suggests that he is distressed more frequently than most of our two-year-olds.

These individual cases have been presented to illustrate individual differences and to help explain why we believe that looking at group characteristics is essential in order to deal with the complexity of the problem of analyzing experiential and developmental patterns.

The Relevance of Child-Rearing Practices to the Stream of Experience

(Task) Data

We want to identify differences in the history of experience of A and C children in order to be able to generate hypotheses about excellent child-rearing practices. Again, I am obliged to counsel the reader about the tentative nature of what follows. Much of what I will suggest is based on other data we have been collecting and also on the general informal information we have gained because of the many visits we have made to the homes of the families in the study.

The child at one year of age. Most all one-year-olds appear to resemble each other in a few interesting and fundamental ways. First of all, perhaps the hallmark of this age is curiosity. The one-year-old seems genuinely interested in exploring his world throughout the major portion of his day. Aside from meal times, and the need to relieve various occasional physical discomforts, his consuming interest is in exploration. But not all situations are optimal for nurturing that curiosity nor are the rules governing exploratory behavior equivalent across homes. Nonetheless, the one-year-old is primed for expending enormous amounts of energy exploring and learning about his world.

Second, the one-year-old is an incomplete master of his body. The development of gross motor skills such as walking, climbing and running, along with special variations such as sliding down ramps, and pushing and hauling large objects, will occupy much of his time during the second year of life. In addition, fine motor skills having to do with the use of his hands seem to be at the heart of many of the activities of the second year.

Third, and of special importance, is that the one-year-old seems to be in the middle of two social developmental processes wherein he is learning gradually about his potential as an agent, as an "I" or "me" and about his power over and dependence upon his mother. During the second year, unlike any other time in his life, he seems to develop along these directions in a manner that may produce a vigorous, secure, loving and healthy social animal or he may take other paths. He may become a modest form of social tyrant by two, whose major orientation during his waking hours is clinging to and dominating his mother, or he may learn that his mother is rather unpredictable; someone to fear while at other times someone who will protect him.

There are many more ideas of possible consequence that could be expressed about the one-year-old but I would rather move at this point to a discussion of the role of the mother in the development of the child of this age.

Mothering, a vastly underrated occupation. I will begin with the bold statement, that the mother's direct and indirect actions with regard to her one- to three-year-old child are, in my opinion, the most powerful formative factors in the development of a pre-school child. Further, I would guess that if a mother does a fine job in the pre-school years, subsequent educators such as teachers will find their chances for effectiveness maximized. Finally, I would expect that much of the basic quality of the entire life of an individual is determined by the mother's actions during these two years. Obviously, I could be very wrong about these declarative statements. I make them as very strong hunches that I have

become committed to, as a kind of net result of all our inquiries into early development.

Let me quickly add that I believe most women are capable of doing a fine job with their one- to three-year-old children. Our study has convinced us that a mother need not necessarily have even a high school diploma, let alone a college education. Nor does she need to have very substantial economic assets. In addition, it is clear that a good job can be accomplished without a father in the home. In all of these statements I see considerable hope for future generations.

Best guesses about most effective child-rearing practices. Our most effective mothers do not devote the bulk of their day to rearing their children; most of them are far too busy to do so. Many of them, in fact, have part-time jobs. What they seem to do, often without knowing exactly why, is to perform excellently the functions of designer and consultant. By that I mean they design a physical world, mainly in the home, that is beautifully suited to nurturing the burgeoning curiosity of the one-to three-year-old. It is full of small manipulable, visually detailed objects, some of which were originally designed for young children (toys), others normally used for other purposes (plastic refrigerator containers, bottle caps, baby food jars and covers, shoes, magazines, television and radio knobs, etc.). It contains things to climb such as chairs, benches, sofas, stairs, etc. It includes a rich variety of interesting things to look at such as television, people, and the aforementioned types of physical objects.

In addition to being largely responsible for the type of environment the child has, this mother sets up guides for her child's behavior which

seem to play a very important role in these processes. She is generally permissive and indulgent. The child is encouraged in the vast majority of his explorations. When the child confronts an interesting or difficult situation, he often turns to his mother for help. Though usually working at some chore, she is generally within earshot. He then goes to her and usually, but not always is responded to by his mother with help or shared enthusiasm plus, occasionally, an interesting, naturally related idea. These ten-to-thirty second interchanges are usually oriented around the child's interest of the moment rather than toward some need or interest of the mother. At times, under these circumstances, the child will not receive immediate attention. These effective mothers do not always drop what they are doing to attend to his request; but rather if the time is obviously inconvenient, they say so, thereby probably giving the child a realistic small taste of things to come.

These mothers very rarely spend five, ten or twenty minutes teaching their one or two-year-olds, but they get an enormous amount of teaching in "on the fly," and usually at the child's instigation. Though they do volunteer comments opportunistically, they mostly act in response to overtures by the child.

These effective mothers talk a great deal to their infants, and very often, at a level the child can handle. Furthermore, they seem to be people with high levels of energy. The work of a young mother, without household help is, in spite of modern appliances, very time and energy consuming. Yet, we have families subsisting at a welfare level of income,

with as many as eight closely-spaced children which are doing every bit as good a job in child rearing during the early years as the most advantaged homes.

CONCLUDING REMARKS

Our study is five years old, but still obviously young. We expect to know more about excellent child-rearing practices as we complete data collection and analysis on our current longitudinal natural experiment. Subsequently, it should take about a year to prepare for our first longitudinal study where families will help us put our hypotheses to experimental test. In succeeding years we expect to strengthen and make more specific our understanding of how to structure early experiences so as to assist each child to a solid start in life.

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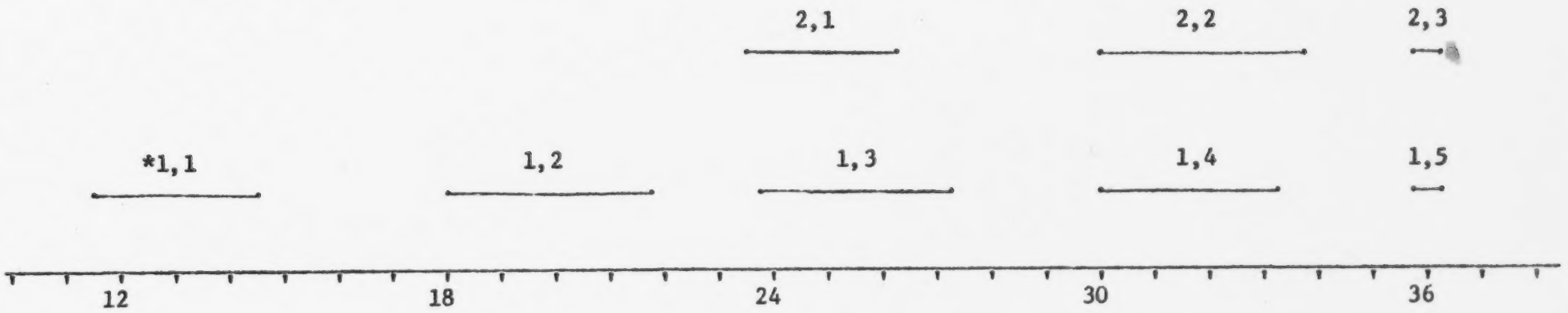
FIGURE 1

SCHEDULE OF RUNS

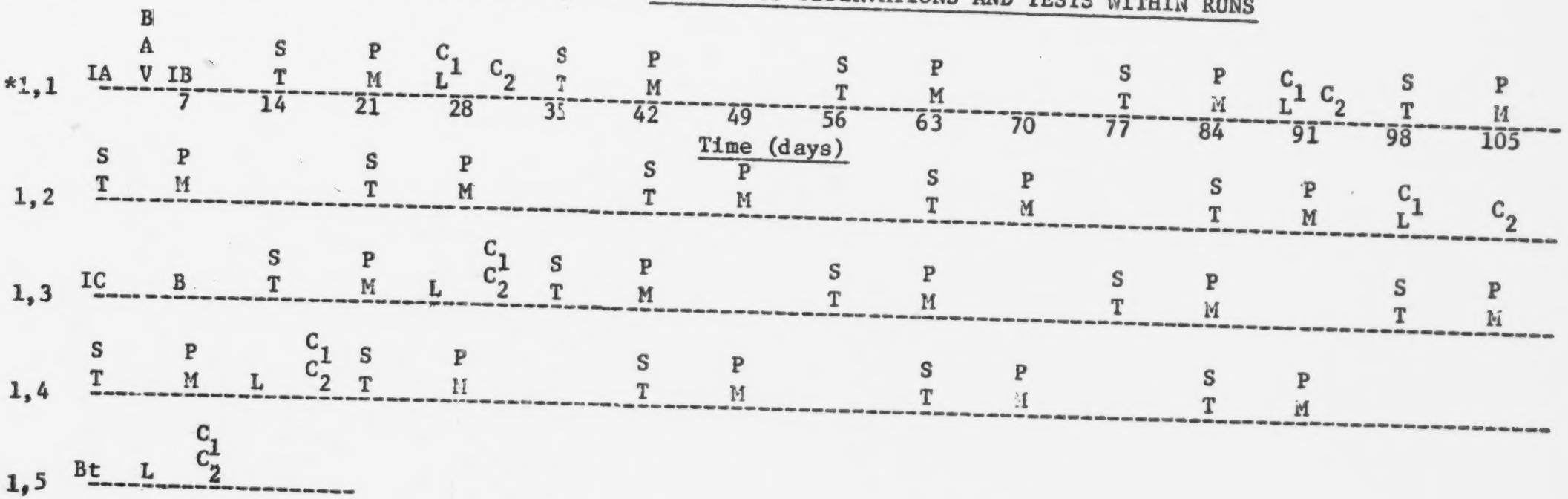
PRE-SCHOOL PROJECT



Chronological Age of Child (months)

* first number is the starting age of child,
second number is the run number

FIGURE 2 Pre-School Project - DETAILS OF OBSERVATIONS AND TESTS WITHIN RUNS


*1,1
IA V B A IB
S T P M C_1 L C_2 S T P M S T P M S T P M C_1 L C_2 S T P M
7 14 21 28 35 42 49 56 63 70 77 84 91 98 105
Time (days)
1,2
S T P M S T P M S T P M S T P M S T P M C_1 L C_2
1,3
IC B S T P M L C_1 C_2 S T P M S T P M S T P M S T P M
1,4
S T P M L C_1 C_2 S T P M S T P M S T P M S T P M
1,5
Bt L C_1 C_2
2,1
IA V B A IB S T P M L C_1 C_2 S T P M S T P M S T P M L C_1 C_2 S T P M
7 14 21 28 35 42 49 56 63 70 77 84 91 98 105
2,2
L C_1 C_2 S T P M S T P M S T P M S T P M S T P M
2,3
Bt L C_1 C_2 ID

CODE:

- IA - Interview A
- IB - Interview B
- IC - Interview C
- ID - Interview D
- L - Language
- A - Auditory Screening
- V - Visual Screening

- T - Task Observation
- S - Social Competence Observation
- M - Maternal Behavior Observation
- P - Use of the Physical Environment
- B - Bayley
- Bt - Binet
- C_1 - Discrimination Test
- C_2 - Abstract Abilities (Hunt-Uzgiris for 1-yr-old; Meyer for 2-yr-old)

* first number is the starting age of child, second number is the run number

FIGURE 3

PRE-SCHOOL PROJECT TASK SCALE

Selected Social Tasks of 1-yr-olds

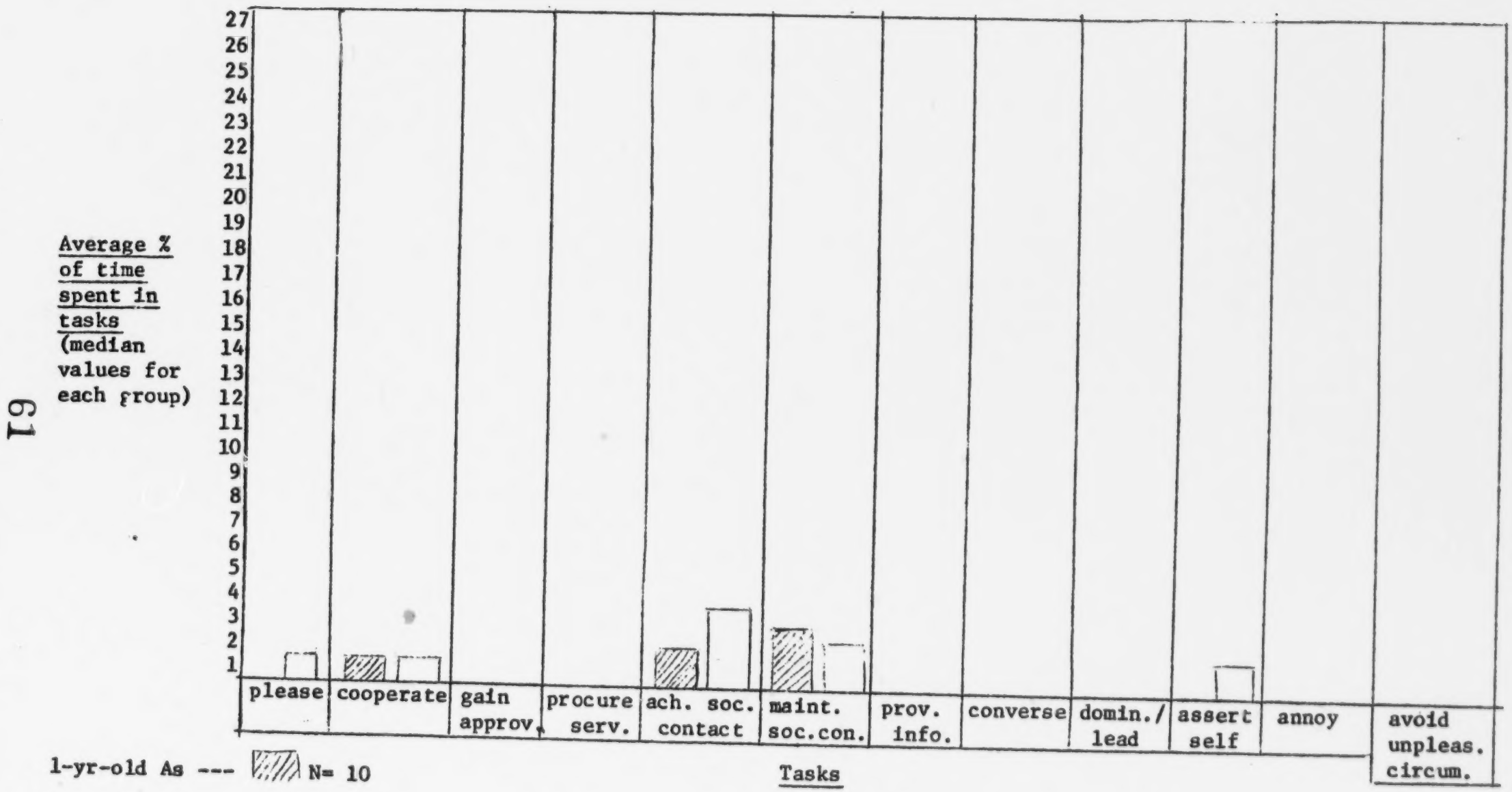
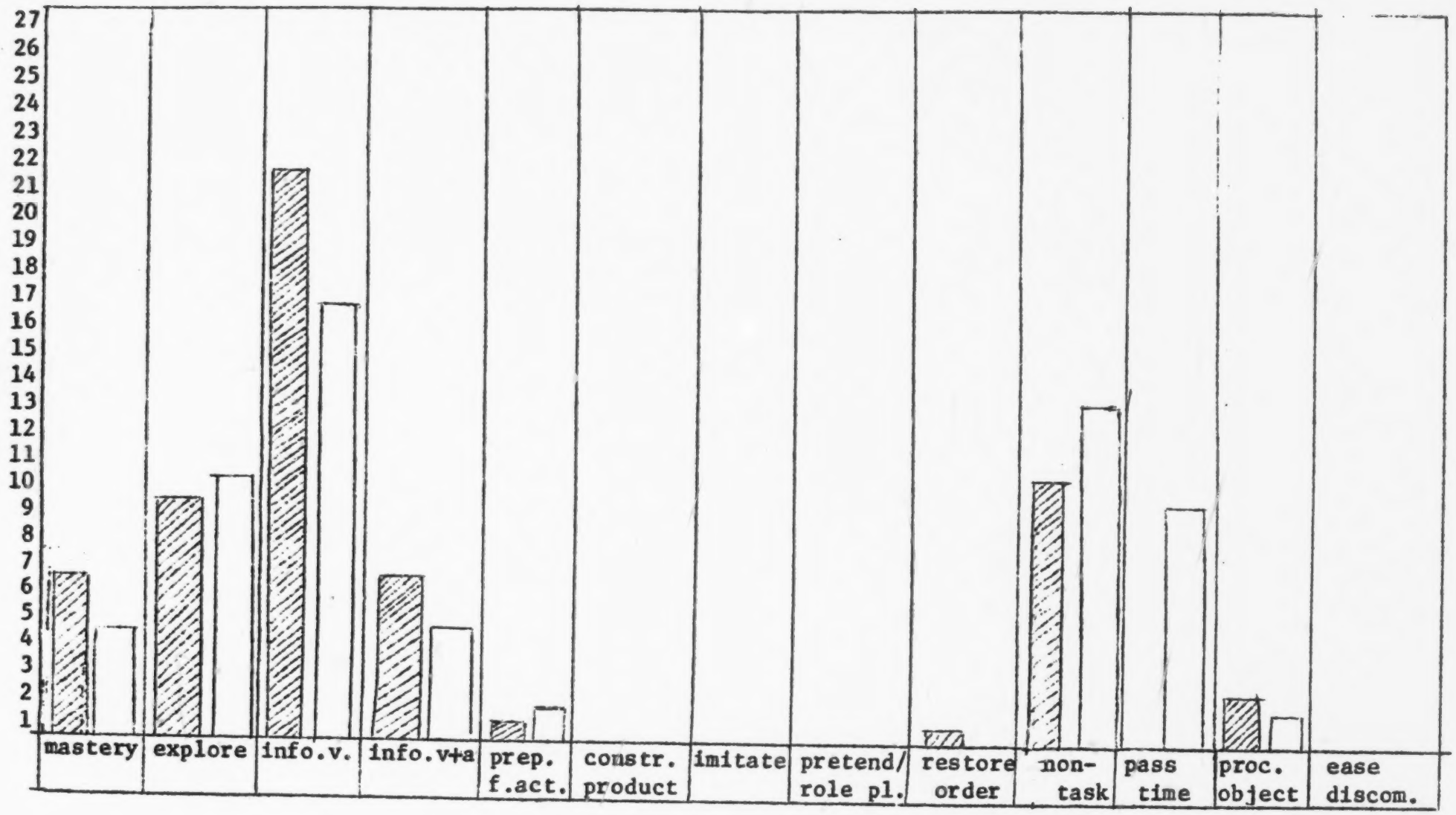


FIGURE 4

PRE-SCHOOL PROJECT TASK SCALE

Selected Non-Social Tasks of 1-yr-olds



1-yr-old As --- N= 10

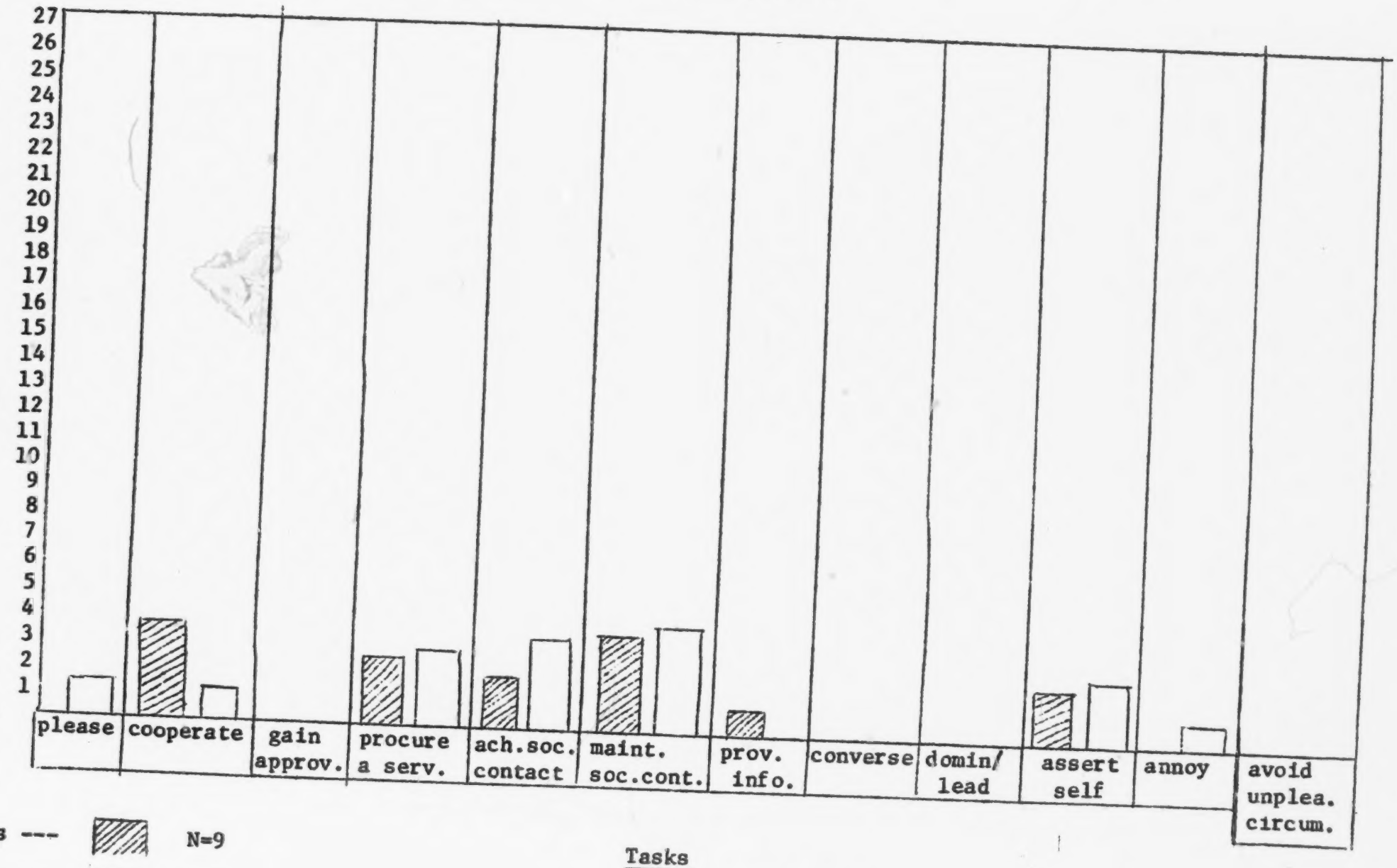
1-yr-old Cs --- N= 3

Each subject observed once each 3 wks. for 15 wks. (12-15 mos.) Each visit = 3-10 min. continuous observations.

FIGURE 5

PRE-SCHOOL PROJECT TASK SCALE

Selected Social Tasks of 2-yr-olds



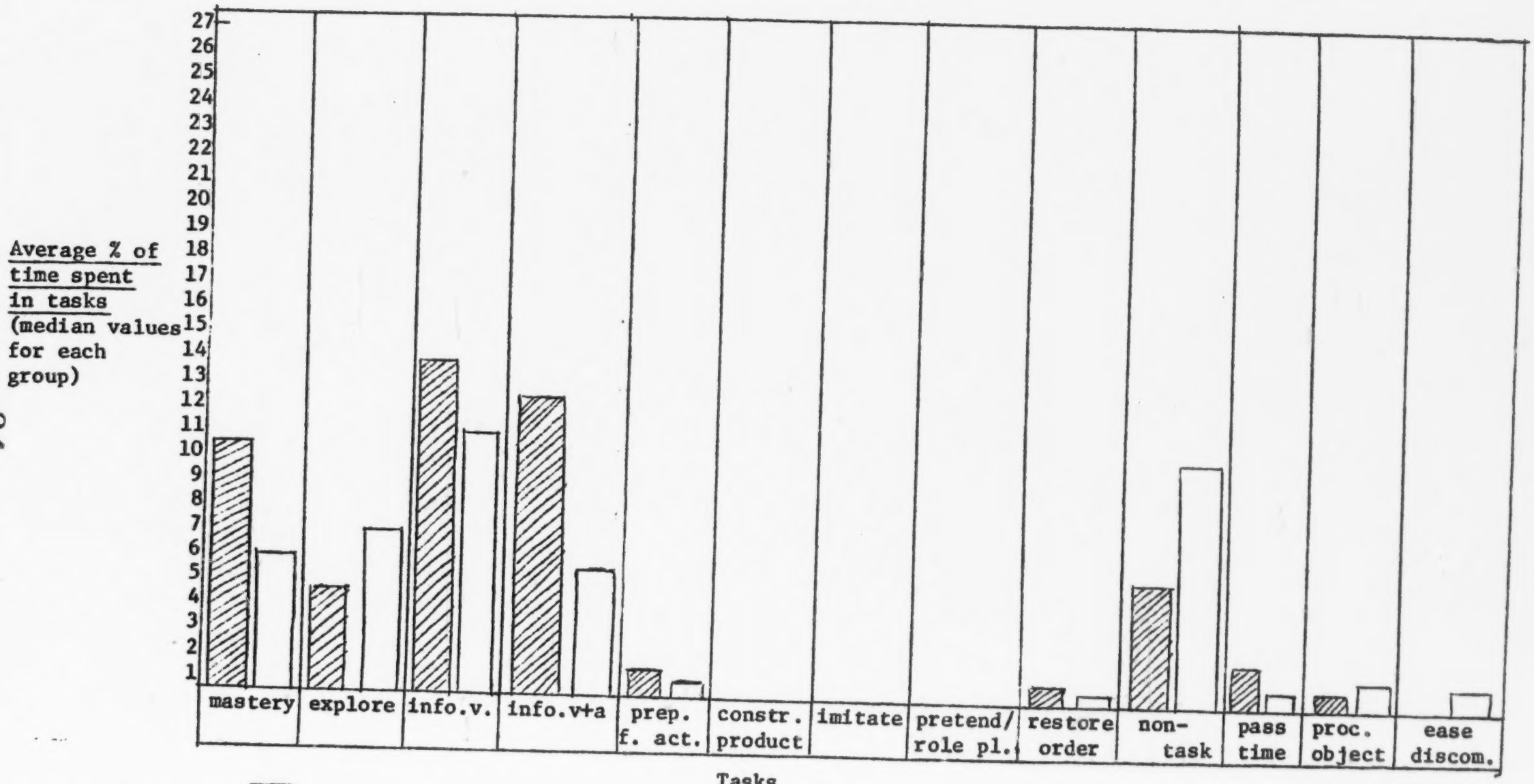
2-yr-old As --- N=9

2-yr-old Cs --- N=4

FIGURE 6

PRE-SCHOOL PROJECT TASK SCALE

Selected Non-Social Tasks of 2-yr-olds



2-yr-old As --- N= 9

2-yr-old Cs --- N= 4

Each subject observed once each 3 wks. for 15 wks. (24-27 mos.). Each visit = 3-10 min. continuous observations

FIGURE 7

PRE-SCHOOL PROJECT TASK SCALE

Selected Social Tasks of 1A

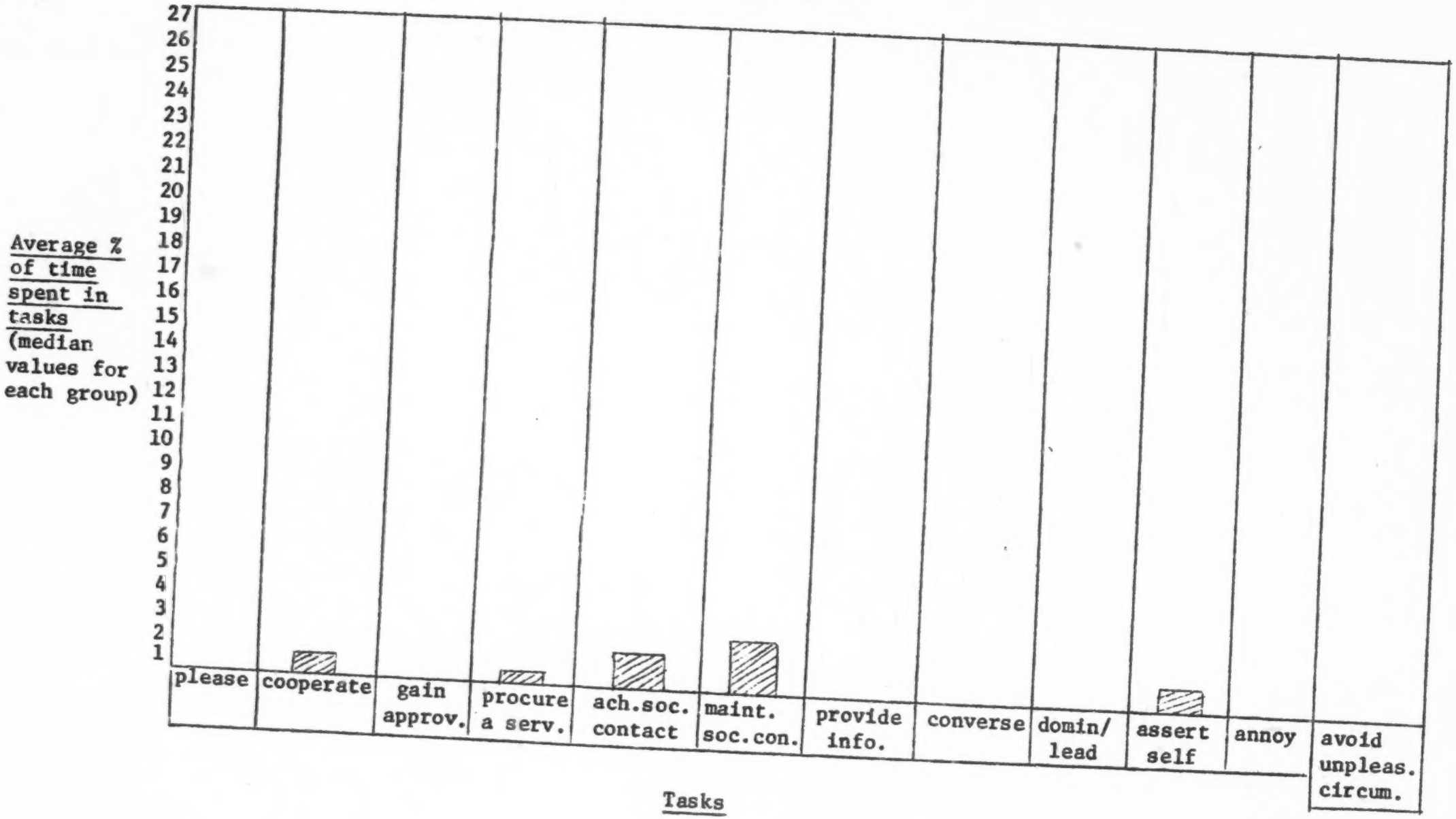


FIGURE 8

PRE-SCHOOL PROJECT TASK SCALE

Selected Non-Social Tasks of 1A

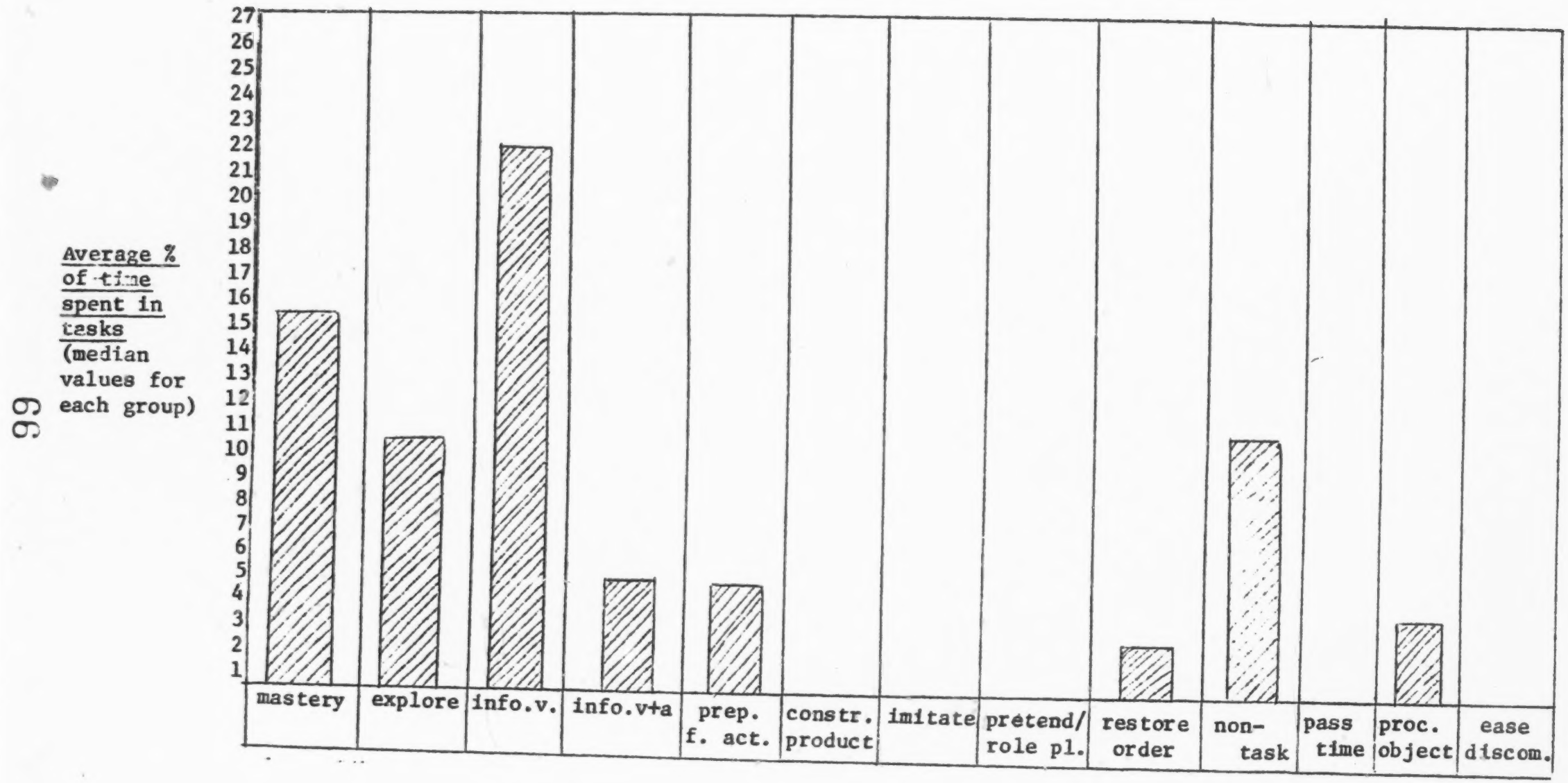


FIGURE 9

PRE-SCHOOL PROJECT TASK SCALE

Selected Social Tasks of $1C_1$

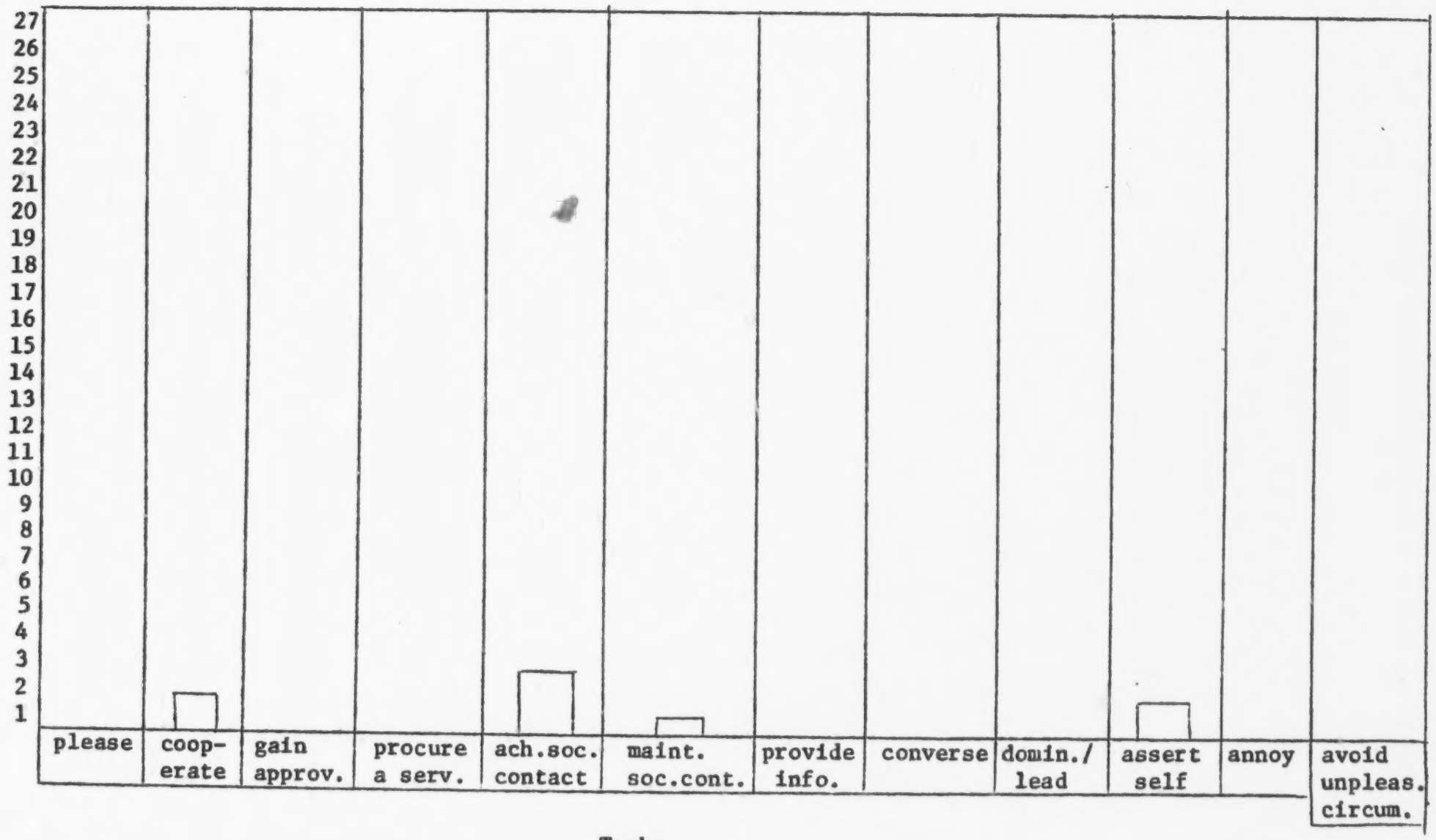


FIGURE 10

PRE-SCHOOL PROJECT TASK SCALE

Selected Non-Social Tasks of $1C_1$

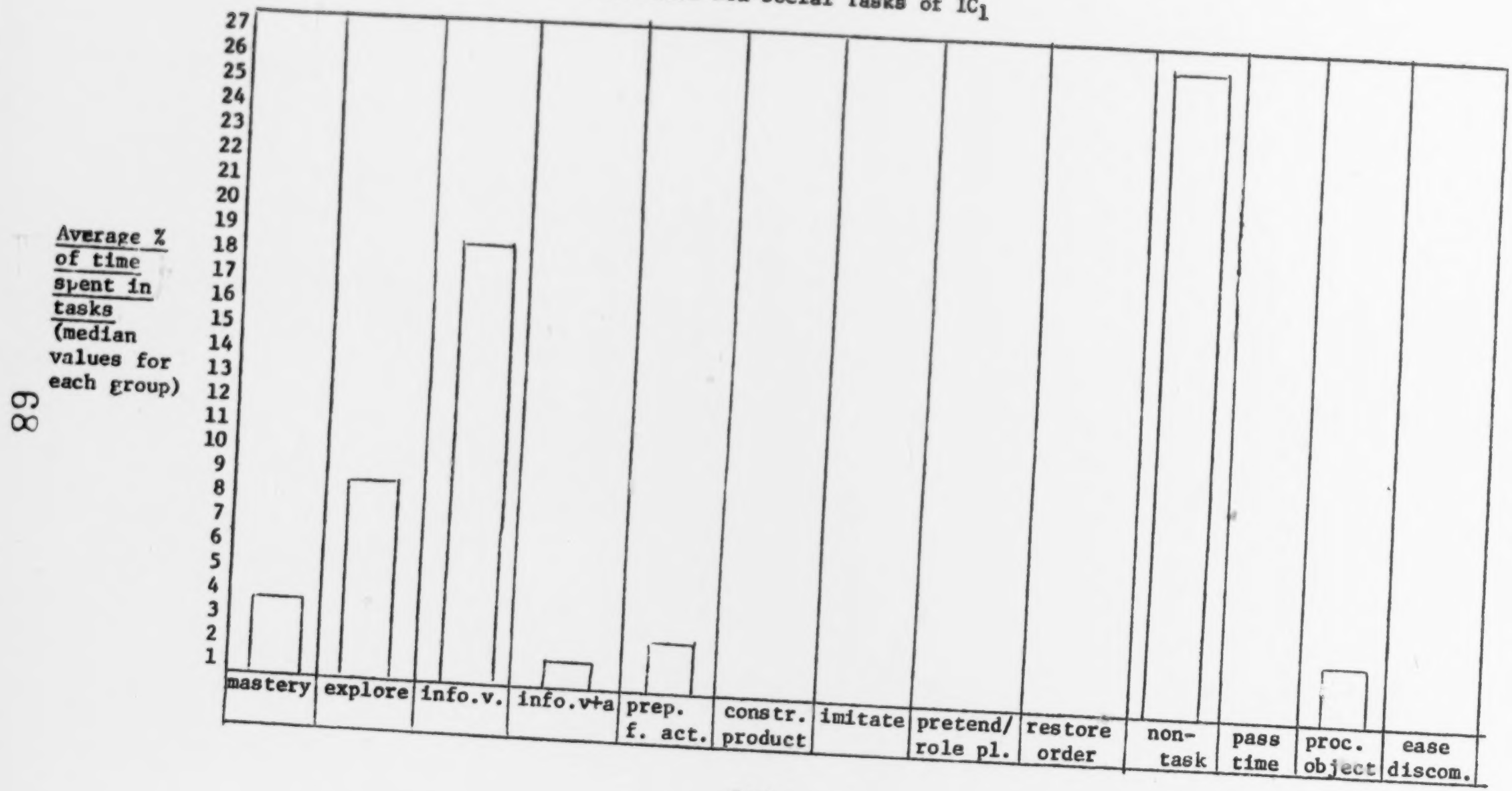


FIGURE 11

PRE-SCHOOL PROJECT TASK SCALE

Selected Social Tasks of $1C_2$

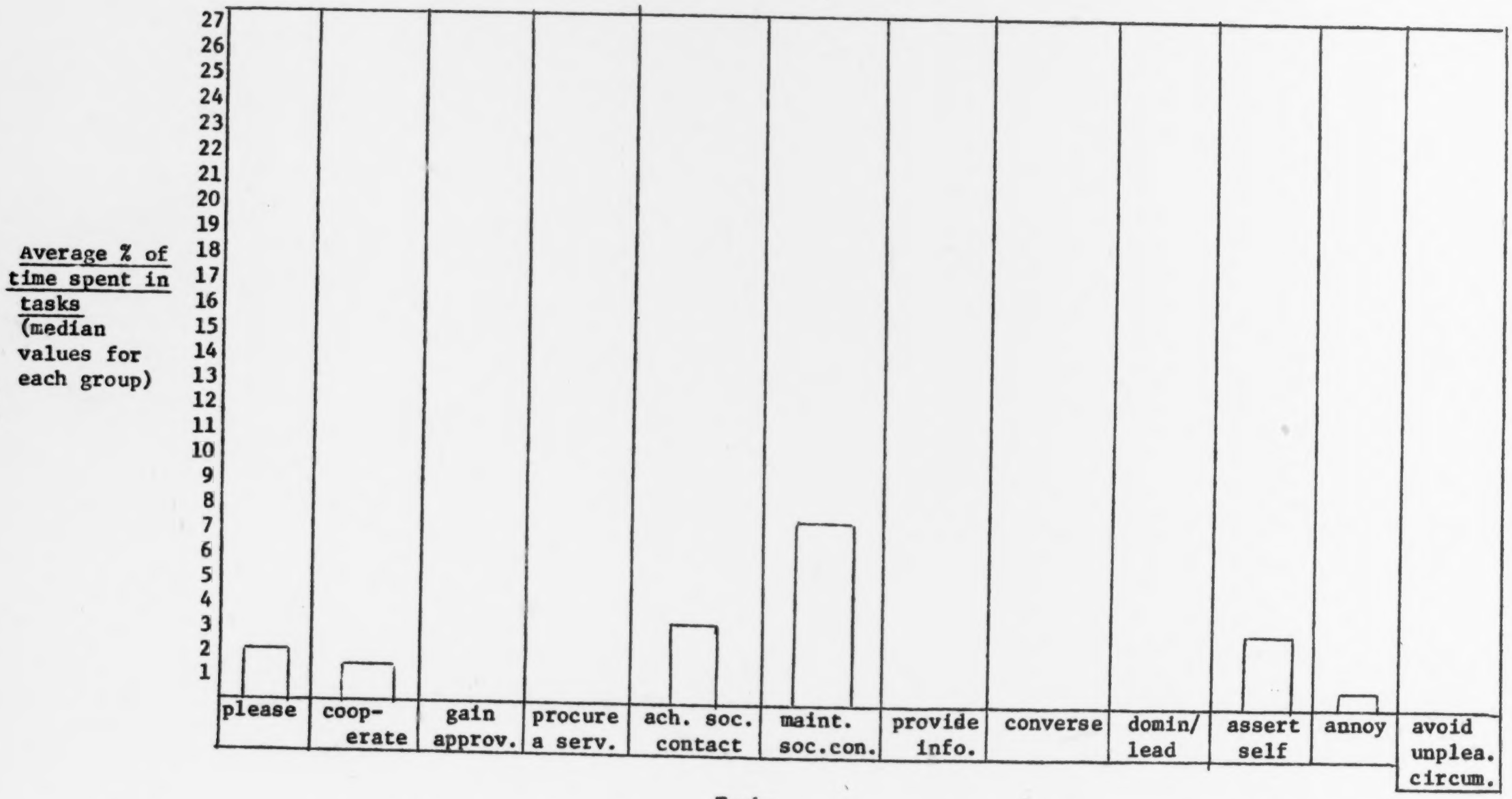


FIGURE 12

PRE-SCHOOL PROJECT TASK SCALE

Selected Non-Social Tasks of $1C_2$

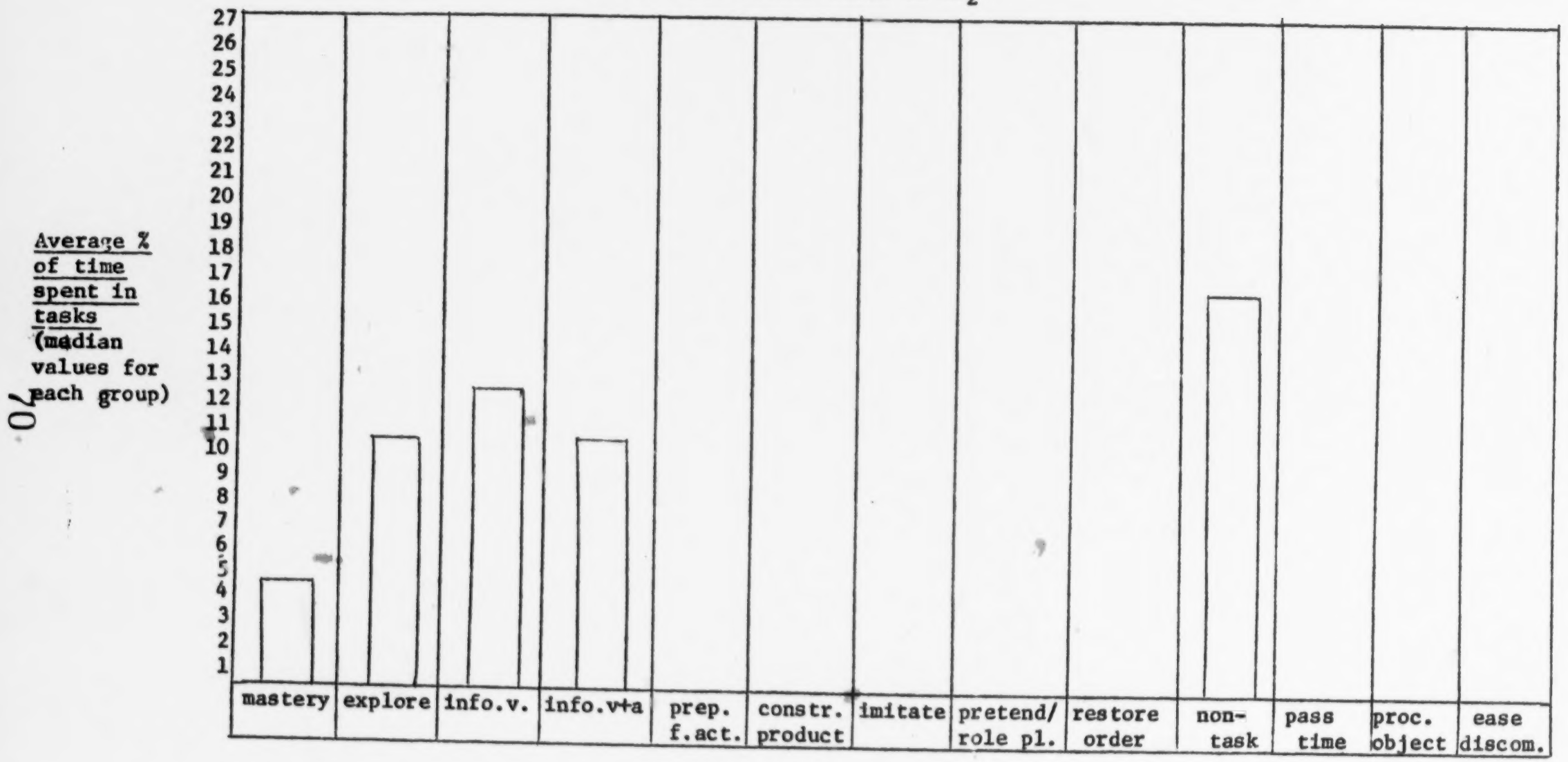


FIGURE 13

PRE-SCHOOL PROJECT TASK SCALE

Selected Social Tasks of 2A

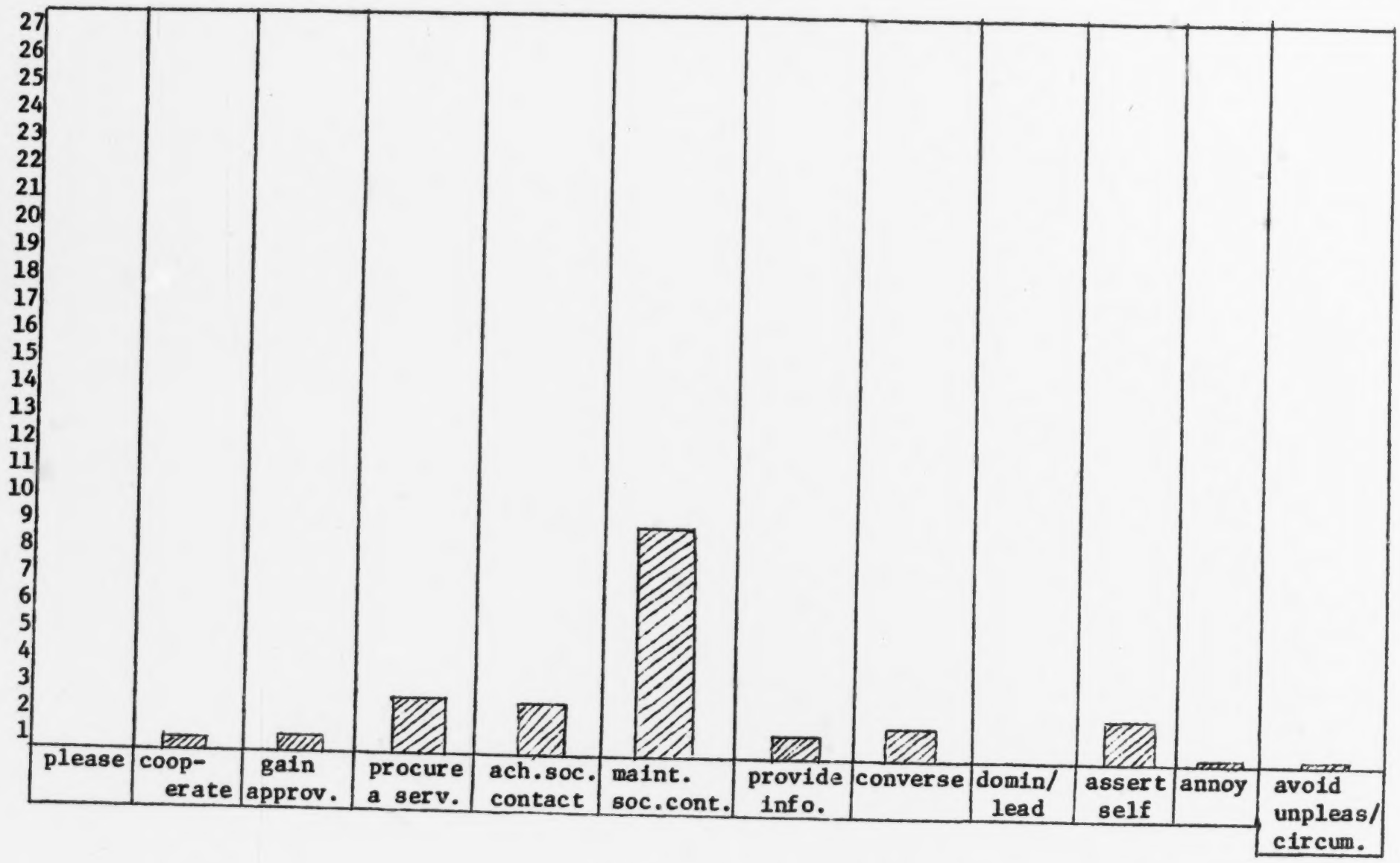


FIGURE 14

PRE-SCHOOL PROJECT TASK SCALE

Selected Non-Social Tasks of 2A

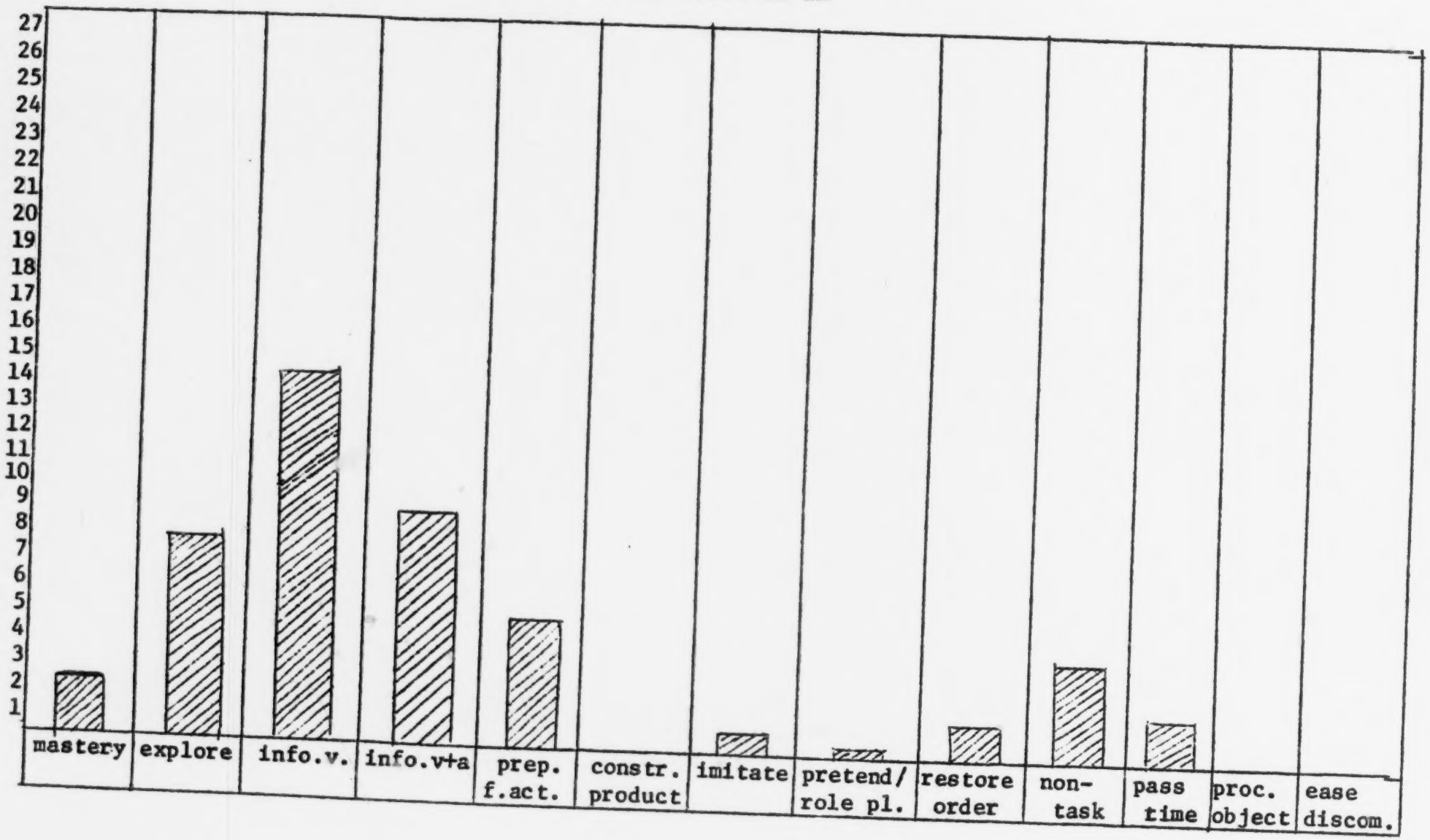


FIGURE 15

PRE-SCHOOL PROJECT TASK SCALE

Selected Social Tasks of 2C

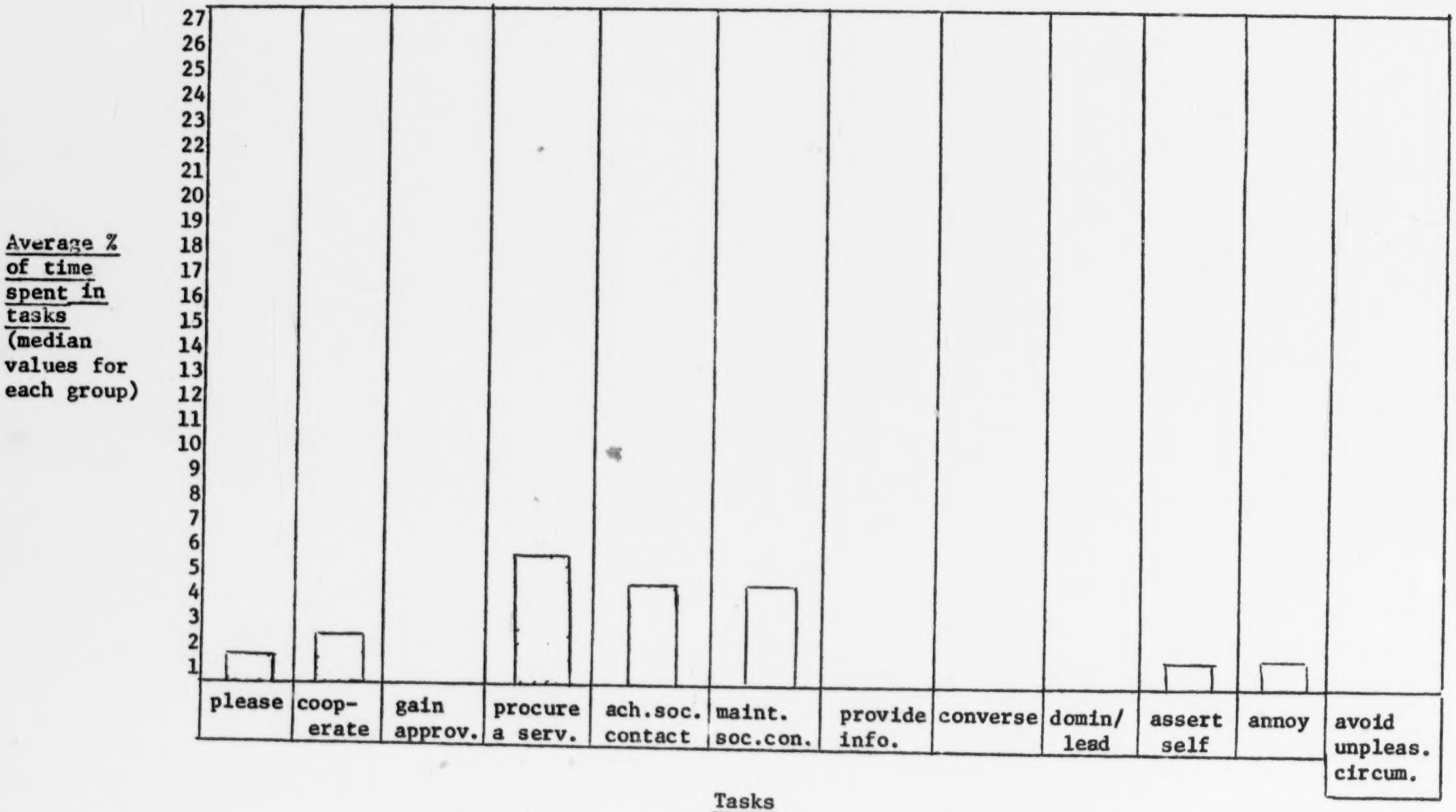


FIGURE 16

PRE-SCHOOL PROJECT TASK SCALE

Selected Non-Social Tasks of 2C

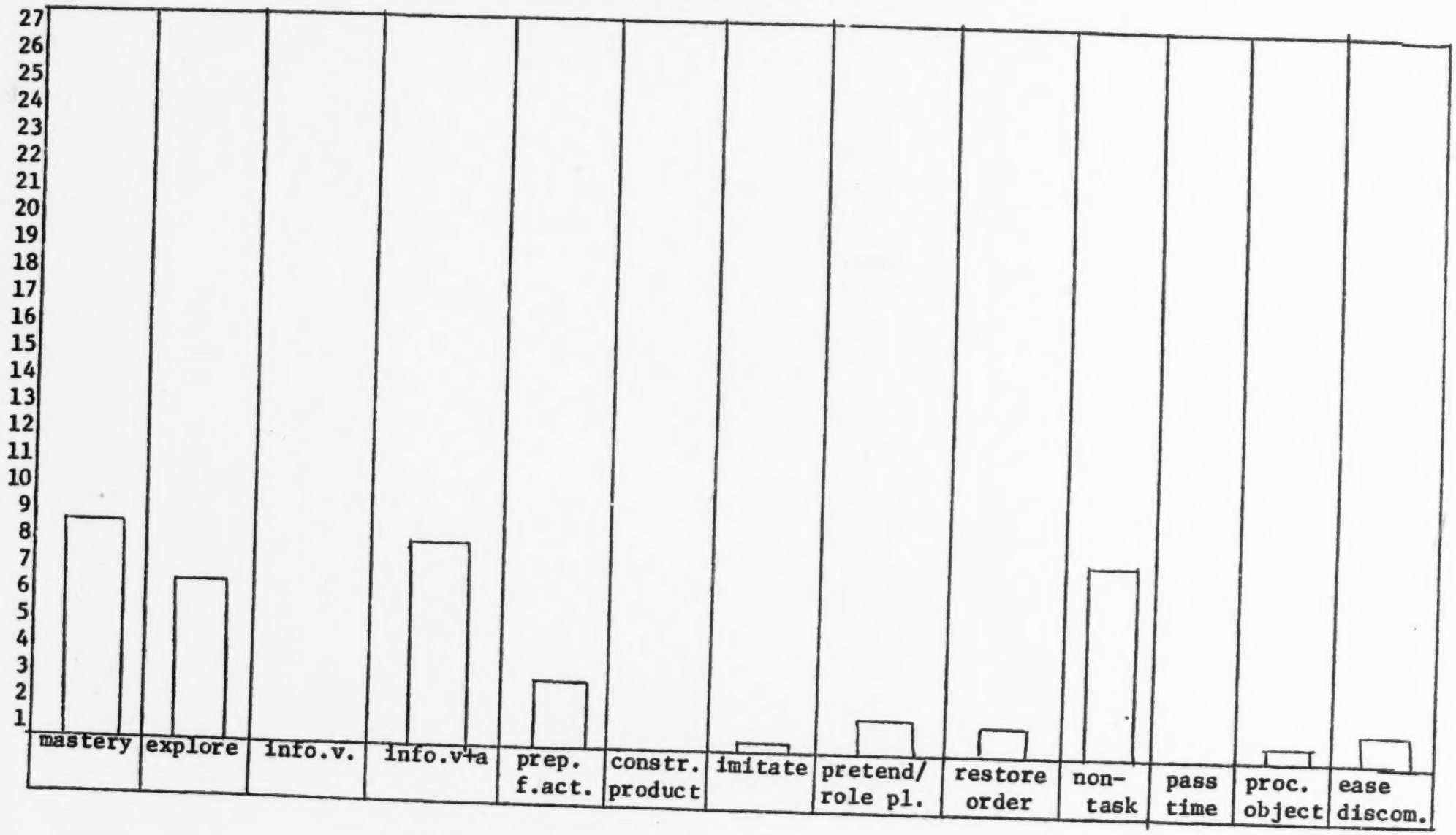


TABLE 1

Pre-School Project Task Scale
Data Summary for Selected Tasks, Given in % Duration of Task -- Median(M)

SOCIAL TASKS

	M	M	M	M	M	M	M	M	M	M	M	M		
1A	0.3	5.6	0.0	2.0	1.0	1.0	0.0	0.0	0.0	0.3	0.0	0.0	12%	T= 9000 1/5=1800
2A	0.0	0.8	0.0	2.0	3.0	7.0	0.0	0.0	0.0	0.3	0.0	0.0	16%	T= 9000 1/5=1800
3A	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	9%	T= 9000 1/5=1800
4A	0.0	1.7	0.0	1.0	4.0	7.0	0.0	0.0	0.0	0.3	0.0	0.0	15%	T= 9000 1/5=1800
5A	0.0	0.0	0.0	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	12%	T= 9000 1/5=1800
6A	0.0	9.0	0.0	0.0	1.4	1.0	0.0	0.0	0.0	0.6	0.0	0.0	8%	T=8920 1/5=1784
7A	0.0	0.0	0.0	0.0	7.0	2.0	0.0	0.0	0.0	0.8	0.0	0.0	11%	T= 9000 1/5=1800
8A	0.0	0.5	0.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	8%	T= 8565 1/5=1713
9A	0.0	0.8	0.0	0.0	1.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	6%	T= 9000 1/5=1800
10A	0.0	0.3	0.0	0.0	1.1	1.9	0.0	0.0	0.0	0.3	0.0	0.0	8%	T= 9000 1/5=1800
11C	1.6	1.3	0.0	0.0	3.0	7.0	0.0	0.0	0.0	2.0	0.0	0.0	26%	T= 7940 1/5=1588
12C	0.0	0.0	0.0	0.0	0.4	0.2	0.0	0.0	0.0	0.8	0.0	0.0	3%	T= 6000 1/5=1500
13C	0.0	1.4	0.0	0.0	2.0	0.6	0.0	0.0	0.0	1.0	0.0	0.0	10%	T= 8775 1/5=1775
1-yr-old subjects	please	coop-erate	gain approv.	proc.a serv.	ach.soc contact	maint. soc.cont.	prov. info.	converse	domin/ lead	assert self	annoy	avoid unpleas circum.	total social tasks	T=total 1/5=1 day (seconds observed)
Total Groups (medians)														
predicted 1-yr As	0.0	0.7	0.0	0.0	1.3	2.0	0.0	0.0	0.0	0.0	0.0	0.0	10%	
predicted 1-yr Cs	0.0	1.3	0.0	0.0	2.0	0.6	0.0	0.0	0.0	1.0	0.0	0.0	10%	

TABLE 2

Pre-School Project Task Scale
Data Summary for Selected Tasks, Given in % Duration of Task -- Median(M)

NON-SOCIAL TASKS

	M	M	M	M	M	M	M	M	M	M	M	M	M		
1A	9.0	9.0	21.0	21.0	1.0	0.0	0.0	0.0	1.0	0.3	5.0	0.6	0.0	88%	T= 9000 1/5=1800
2A	4.0	8.0	31.0	11.0	0.0	0.0	0.0	0.0	1.0	0.0	7.0	0.0	0.0	84%	T= 9000 1/5=1800
3A	10.0	5.0	23.0	7.0	3.0	0.0	0.0	0.0	0.0	0.0	7.0	1.0	0.0	91%	T= 9000 1/5=1800
4A	5.0	8.0	20.0	4.0	0.0	0.0	0.0	0.0	9.0	0.6	14.0	0.0	1.0	85%	T= 9000 1/5=1800
5A	8.0	17.0	22.0	6.0	0.0	0.0	0.0	0.0	2.0	0.0	9.0	0.0	0.0	88%	T= 9000 1/5=1800
6A	7.0	5.0	13.0	19.0	0.0	0.0	0.0	0.0	2.0	1.4	11.8	0.0	0.0	92%	T= 8920 1/5=1784
7A	0.6	9.0	43.0	5.0	0.0	0.0	0.0	0.0	1.0	0.0	7.0	0.0	0.0	89%	T= 9000 1/5=1800
8A	1.0	21.0	19.0	1.0	0.0	0.0	0.0	0.0	0.3	0.0	13.0	1.0	0.0	92%	T=8565 1/5=1713
9A	3.0	13.0	26.0	6.0	1.9	0.0	0.0	0.0	4.0	0.5	17.0	10.0	0.0	94%	T= 9000 1/5=1800
10A	15.0	10.0	22.2	4.4	3.1	0.0	0.0	0.0	3.1	1.1	10.3	0.0	0.0	92%	T= 9000 1/5=1800
11C	4.0	10.0	12.0	10.0	0.9	0.0	0.0	0.0	0.3	0.0	16.0	0.0	0.0	74%	T= 7940 1/5=1528
12C	0.0	8.8	25.4	4.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	51.3	0.0	97%	T= 6000 1/5=1500
13C	3.0	9.0	18.0	1.0	2.3	0.0	0.0	0.0	2.0	0.0	26.0	0.1	0.0	90%	T= 8775 1/5=1755
1-yr-old subjects	mastery	explore	info. v.	info. v.+ a.	prep.f. activ.	constr. product	imitate	pretend role pl	proc. obj.	restore order	non-task	pass time	ease discom	total non-social tasks	T= total 1/5=1 day (seconds observed)
Total Groups (medians)															
predicted 1-yr.As	6.0	9.0	22.1	6.0	0.8	0.0	0.0	0.0	1.5	0.1	9.6	0.0	0.0	90%	
predicted 1-yr. Cs	3.0	9.0	18.0	4.6	0.9	0.0	0.0	0.0	0.3	0.0	16.0	0.1	0.0	90%	

TABLE 3

Pre-School Project Task Scale
Data Summary for Selected Tasks, Given in % Duration of Task -- Median (M)

SOCIAL TASKS

	M	M	M	M	M	M	M	M	M	M	M	M		
1A	0.0	0.3	0.3	2.0	2.0	9.0	0.6	0.6	0.0	0.8	0.0	0.0	25%	T= 9000 1/5=1800
2A	0.0	5.6	0.0	0.8	2.2	1.4	0.3	0.0	0.0	1.4	0.0	0.0	16%	T= 9000 1/5=1800
3A	0.0	4.6	0.0	2.0	1.2	3.5	0.0	0.0	0.0	1.2	0.0	0.0	20%	T=8660 1/5=1732
4A	0.0	0.3	0.0	0.0	1.0	3.0	0.3	0.0	0.0	1.0	0.0	0.0	16%	T= 9000 1/5=1800
5A	0.0	1.0	0.0	2.0	3.0	8.0	0.0	0.0	0.0	1.0	0.0	0.0	22%	T= 9000 1/5=1800
6A	1.0	5.5	0.6	3.0	1.0	0.5	0.6	0.0	0.0	0.0	0.0	0.0	17%	T= 9000 1/5=1800
7A	0.0	2.0	0.6	1.5	2.8	0.4	0.3	4.5	1.0	1.5	0.0	0.0	24%	T= 8360 1/5=1672
8A	0.0	3.0	0.0	0.0	1.0	1.7	0.0	0.0	0.0	2.5	0.0	0.0	14%	T= 8910 1/5=1782
9A	0.0	3.6	0.0	2.5	1.0	7.8	0.0	0.3	0.0	1.9	0.0	0.0	26%	T=9000 1/5=1800
10C	0.3	0.9	0.0	3.0	3.9	5.7	0.0	0.0	0.0	2.1	0.9	0.0	21%	T= 8390 1/5=1672
11C	1.0	2.0	0.0	5.0	4.0	4.0	0.0	0.0	0.0	1.0	1.0	0.0	29%	T= 9000 1/5=1800
12C	1.0	0.5	0.0	0.0	2.0	1.0	0.0	0.0	0.0	0.5	0.0	0.5	11%	T= 8960 1/5=1792
13C	0.0	0.6	0.0	1.4	1.1	3.0	0.0	0.0	0.0	2.8	0.0	0.0	12%	T= 9000 1/5=1800
2-yr-old subjects	please	coop-erate	gain approv.	proc. service	ach.soc. contact	maint. soc.con.	prov. info.	converse	domin/ lead	assert self	annoy	avoid unplea. circum.	total social tasks	T= total 1/5=1 day (seconds observed)
Total Groups (medians)														
predicted 2-yr. As	0.0	3.0	0.0	2.0	1.2	3.0	0.3	0.0	0.0	1.5	0.0	0.0	20%	
predicted 2-yr. Cs	1.0	0.8	0.0	2.2	3.0	3.5	0.0	0.0	0.0	1.6	0.5	0.0	18%	

TABLE 4

Pre-School Project Task Scale
Data Summary for Selected Tasks, Given in % Duration of Task -- Median (M)

NON-SOCIAL TASKS

	M	M	M	M	M	M	M	M	M	M	M	M	M		
1A	2.0	7.5	14.0	8.6	4.2	0.0	0.3	0.0	0.0	1.0	3.8	1.4	0.0	75%	T= 9000 1/5=1800
2A	3.6	6.7	22.5	13.9	1.4	0.0	0.0	0.0	1.4	0.3	5.3	0.8	0.3	84%	T= 9000 1/5=1800
3A	39.0	3.1	11.3	8.7	0.6	0.0	0.0	0.0	0.3	0.0	4.6	1.7	0.3	80%	T= 8660 1/5=1732
4A	0.0	3.0	9.0	43.0	1.1	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	84%	T= 9000 1/5=1800
5A	10.0	7.5	13.6	8.0	0.8	0.0	0.0	1.4	0.3	0.3	2.0	0.0	0.0	78%	T= 9000 1/5=1800
6A	11.0	4.0	11.0	12.0	4.2	0.0	0.0	0.0	0.0	0.0	10.0	3.0	0.0	83%	T= 9000 1/5=1800
7A	4.0	0.3	9.0	20.0	4.2	0.0	0.3	0.0	3.0	0.0	5.0	0.3	0.0	76%	T= 8360 1/5=1672
8A	13.5	1.4	15.0	12.0	0.8	0.0	0.0	0.0	1.7	0.3	12.6	1.7	0.0	86%	T= 8910 1/5=1782
9A	0.3	8.7	16.9	7.5	0.0	0.0	0.0	0.6	0.8	0.6	5.8	0.8	0.0	74%	T= 9000 1/5=1800
10C	5.7	6.3	8.0	5.0	0.0	0.0	0.0	0.0	2.1	0.0	9.2	4.8	0.0	79%	T= 8390 1/5=1678
11C	8.0	6.0	7.5	5.0	2.5	0.0	0.0	1.0	0.3	0.5	7.0	0.0	1.0	71%	T= 9000 1/5=1800
12C	2.7	4.0	30.0	19.0	0.8	0.0	0.0	0.0	0.3	0.0	10.0	0.8	0.0	89%	T=8960 1/5=1792
13C	7.5	23.9	13.3	3.6	0.6	0.0	0.0	0.0	1.7	0.6	16.9	0.0	0.6	88%	T= 9000 1/5=1800
2-yr-old subjects	mastery	explore	info. v.	info. v.+ a.	prep.f. activ.	constr. prod.	imitate	pretend role pl.	proc. obj.	restore order	non-task	pass time	ease discom.	total non-social tasks	T= total 1/5=1 day (seconds observed)
Total Groups (medians)															
predicted 2-yr. As	10.0	4.0	13.6	12.0	1.1	0.0	0.0	0.0	0.3	0.3	5.0	1.4	0.0	80%	
predicted 2-yr. Cs	6.6	6.2	10.7	5.0	0.7	0.0	0.0	0.0	1.0	0.3	9.6	0.4	0.3	82%	